FACULTY OF BUSINESS AND LAW GRADUATE SCHOOL

Economics for Managers

These study materials have been produced for *Economics for Managers*, which is one of the units offered by the Faculty of Business and Law in Deakin University's flexible learning program.

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Introduction

Welcome to *Economics for Managers*. The purpose of this unit outline is to tell you about:

- the aims, content and overall structure of the unit; and
- how it will operate, including required learning materials.

The unit is designed to provide managers with sufficient economic understanding and analytic tools to effectively assist them in decision making at their workplace. These decisions relate to how organisations can best use economically scarce resources, against the backdrop of the economic environment in which Australian firms operate.

Specifically, the three major aims are to:

- provide students with an understanding of the economic environment and the nature of interactions in the Australian economy which impact on managerial decisions;
- introduce students to the basic principles of microeconomics (i.e. study of individual economic decisions about particular commodities) in the context of firm or corporate level decision making; and
- provide students with the opportunity to apply economic principles to the analysis of important decisions confronting the management of business organisations.

Unit structure

This unit contains 12 topics and is intended for study over a period of around 13 weeks.

Essentially, the unit is divided into five parts as follows:

Topics

1 An introduction to managerial economics

Part 1: Supply and demand analysis

2 The basics of demand and supply

3 Elasticities of demand and supply

Part II: The macroeconomic environment

4 Macroeconomics: Issues, goals and measurement

5 National income determination

6 Aggregate supply, business cycles and policy perspectives

Part III: Production and pricing decisions

7 Production and costs

8 Perfect competition and monopoly

9 Imperfect competition

Part IV: Industry policy

10 Industry policy: The case for government intervention

11 Competition policy and deregulation

Part V: The international scene

12 International trade and global markets

Topic schedule

Week 1	Topic 1	An introduction to managerial economics
Week 2	Topic 2	The basics of demand and supply
Week 3	Topic 3	Elasticities of demand and supply
Week 4	Topic 4	Macroeconomics: Issues, goals and measurement
Week 5	Topic 5	National income determination
Assignment 1		
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Week 9	Topic 9	Imperfect competition
Week 10	Topic 10	Industry policy: The case for government intervention
Week 11	Topic 11	Competition policy and deregulation
Week 12	Topic 12	International trade and global markets
Week 13	*Case study*	

Although we advise you to work according to the weekly schedule, there is of course nothing wrong in adjusting your work load on an individual basis. Personal preference, however, in pacing your way through the course is limited to a certain extent by the timing of the assignments and case study.

Contributors

A significant proportion of this study guide is based on a previous unit developed by Deakin University. Accordingly, the following authors and contributors are acknowledged:

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Laurel has been involved in economics education for many years. After completing her initial qualifications, Laurel taught in secondary schools for some time, before joining RMIT in 1980, and then Deakin University in 1985. At both these institutions she has lectured in macroeconomics and microeconomics at first and second-year level, as well as currently teaching economic policy for post-graduate courses at Deakin.

Laurel is currently studying for her doctorate at Deakin University, and her area of study is 'Post-war economic policy in Australia'. Her other research interests lie in the fields of macroeconomic models and productivity measurement.

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Phillip is a senior lecturer in economics at Deakin University's Burwood Campus. His main teaching areas are in microeconomics and environmental economics. Previously, Phillip lectured in agricultural economics at the Victorian College of Agriculture and Horticulture, and was also a research economist with the Australian Bureau of Agricultural and Resource Economics, responsible for market analysis and policy evaluation work.

His research interests are in environmental management, agricultural policy and business economics.

The unit team wish to also acknowledge the contribution of Judy Cowie, CAMBS *Economics for Managers* unit team member, Centre for Economics Education, University of Adelaide.

Teaching materials

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill Book Company, London.

Students may also wish to purchase the associated student workbook (by Smith, P. & Begg, D.). The workbook contains summaries/reviews and exercises for each topic. (Note, however, the *Economics for Managers* study guide does not require access to this workbook.)

References and further reading

At the completion of each topic you will find a list of references compiled by the author(s). The primary intention of the list is to identify the sources the author has consulted in preparing the topic material.

Most topics also have a list of further reading recommended by the author in case you want to go into more depth in your study.

General references and resources frequently cited in the study guide include:

A. Basic economics texts (most with an Australian perspective)

Baumol. W.J., Blinder, A.S., Gunther, A.W. & Hicks, J.R.L. 1992
Economics: Principles and Policy
2nd Aust. edn, Harcourt Brace Jovanovich, Sydney.

McConnell, C., Jackson, J. and McIver, R. 1994
Economics
4th Aust. edn, Sydney.

McTaggart, D., Findlay, C. & Parkin, M. 1996
Economics
2nd edn, Addison Wesley, Sydney.

Robinson, T., Quayle, M. and McEachern, W. 1994
Macroeconomics: A Contemporary Introduction
Thomas Nelson Australia, Melbourne.

Stiglitz, J.E. 1997
Economics
2nd edn, Norton, New York.

Waud, R. N., Hocking, A., Maxwell, P. and Bonnici, J. 1996
Economics
3rd Aust. edn, Harper Collins, Sydney.

B. Texts with a more applied perspective and greater emphasis on case studies

Mansfield, E. 1994
Applied Economics
Norton, New York.

McGuigan, J.R. & Moyer, R.C. 1993
Managerial Economics
6th edn, West, New York.

Petersen, H.C. and Lewis, W.C. 1994
Managerial Economics
3rd edn, Macmillan, New York.

Study guide and readings

The study guide is your main reference. It contains an extensive commentary divided into 12 topics. The topics also provide various activities, questions, additional reading guidelines and, usually, appended readings. Sample answers to most of the questions in the study guide are provided at the end of each topic.

Working your way through a topic

Each topic begins with an *Introduction* which firstly introduces the topic and places it within the context of the unit structure. Then follows a more detailed account of how the concepts and ideas are to be explored, explanations for their sequence and any other relevant information that will assist you in preparing for study of the topic.

The Introduction is followed by a statement of the specific learning *Objectives* which you should be able to achieve after having completed the topic.

The Introduction and Objectives are your 'road map' for each topic.

Within the body of the topic notes are *in-text questions.* These are designed to actively engage you in thinking, reflecting on, and applying ideas and concepts that are presented to you. Formally numbered questions generally ask for a written response. Other in-text questions may challenge you to think (or reflect) about a particular issue or concept, without actually asking you to respond in writing.

We understand that time is often short, and it may be tempting to skip much of the in-text questions. However, we strongly advise against such practice. Whilst you may very well give less attention to some questions compared to others (according to interest, for example), it is through questions that real, deep learning comes about. In particular, the actual process of writing when formulating an answer is regarded as a powerful learning agent.

The presentation of each topic ends with a *Summary.* You should read this summary in association with a review of the objectives specified and material presented in the Introduction.

At the end of each topic is a set of *review questions* which provide you with an opportunity to consolidate your understanding of each topic.

These questions may serve as a focus for group discussion. Completing the review questions is the best way to ensure that you are on the right track. (*Suggested answers* are provided to assist you in this regard.)

A question of time

Note that your expected time commitment is 8–10 hours per week (including assignment preparation). Depending on your background, you may find some topics more challenging, and hence more time consuming than others; conversely, you may find some topics quite straightforward. (For example, if you have a background in economics, you may find the first few topics relatively easy.)

We encourage you to read more widely if time permits—a list of suggested general references were cited in the previous section. Others are cited under 'Further Reading' at the end of each topic.

Readings from texts or journals are an integral part of the study guide. They should not be seen as independent of, or irrelevant to, the study guide commentary.

The *suggested answers* to in-text questions and review questions (printed on grey paper) provide you with either correct answers to practical problems or a summary of the main points which could be incorporated in your answers. In some cases, authors have extended the answer to a particular question and used it as a teaching device to develop a certain point. Therefore, it is important to read the suggested answers.

Study groups

While the study guide and readings permit an individual to proceed entirely on their own, those enrolled in this unit are encouraged to form self-help study groups; these groups offer valuable assistance in satisfactorily completing this unit.

Off-campus groups may receive visits from university staff—if there is a group of six or more participants in a location. In some instances a teletutorial may be arranged for a group of off-campus students in more distant locations. Details may be confirmed by contacting the unit coordinator at your university.

Assessment

There are two broad categories of assessment for the unit:

- self-assessment
- formal assessment

Self-assessment

A feature of this unit is to encourage you to improve your skills in self-assessment. To this end, and as outlined earlier, we include questions in the study guide which we hope you will find challenging and stimulating. They should encourage you to read questioningly and critically, and may be useful to consider in the context of your own employment and that of your colleagues.

Suggested answers are provided for most questions, to give you quick feedback on your performance. These suggested answers are not intended to be comprehensive in all cases, but will simply point you in the right direction.

These points also apply to formal assessment, where, in addition to providing a mark, we also hope to provide you with feedback that will help you improve your self-assessment.

Formal assessment

For details of the formal assessment, see the Assessment Booklet provided with your study materials.

Economics for Managers

Hello everyone,

Welcome to the beginning of a new semester and a fresh start in a new area of study. I trust you will find *Economics for Managers* both challenging and interesting and that by the end of the semester you will have gained some insight into the way the economy operates and reached a deeper understanding of a particular industry that you will be studying in detail.

I will be chairing the unit from Geelong and working with Dr Philip Hone on the Melbourne (Burwood) campus. I can be contacted through the FirstClass conference, which we will use extensively, or by email (bantow@deakin.edu.au). If the matter is urgent you can ring me on 0419 527 849 or fax (03) 5227 2151.

Contact

FirstClass provides the teaching and learning environment for postgraduate units and allows regular synchronous or asynchronous contact between students and between students and academics. If you are new to *FirstClass* it is helpful to think of it as the electronic equivalent of the physical teaching and learning environment which would be faced by an on-campus student. This environment has been used by our students for many years but in addition we will be trialling a new Instructional Management System called *TopClass* in this unit. This will not require any additional skills to use but we may ask for feedback from time to time to gauge your reactions to this extension to the teaching and learning environment. This is one of only three units in the University which will be part of the pilot study.

Assessment

There are four assessable tasks to be completed during the semester of which three are based on individual work and one on group work. Details of these will be provided online.

The *Economics for Managers* unit is designed to keep you active but provide flexibility within most of the tasks. The asynchronous nature of the technology allows you to work on any day and at any time of the day within a particular task work zone. However this degree of flexibility coupled with incentives to keep pace is sometimes not enough when unforeseen work, social or personal events make life temporarily impossible. The following submission policy allows some respite.

Due dates and cut-off dates

By due date we mean the date at which your assignment should have arrived at Deakin. The cut-off date for each assignment is seven calendar days after the due date. Assignments will be accepted for assessment up to the cut-off date but no later. Assignments received by the due date will normally be assessed by the cut-off date. You are not required to apply for extensions to submit assignments after the due date and before the cut-off date. Assignments submitted between these dates will, however, have a lower priority for the assessor and there may be some delay in posting results.

Extensions are not granted beyond the cut-off date. If you are unable to submit an assignment by the cut-off date, that assignment's marks will be re-allocated to the final examination thereby increasing the weighting of the exam. You may choose to shift the weight of an assessment for Assignment 1 or Assignment 2 to the final examination. You are not required to notify me about this choice as failure to submit by the cut-off date will lead to an automatic adjustment of the weighting. Normally this option is exercised only when personal circumstances make it impossible to meet the work requirements of the unit. This option does not apply to Assignment 3, the Case Study, which is compulsory.

Your task now is to log on to FirstClass where you will find all course materials and further directions. Good luck with your studies in economics and I look forward to working with you soon.

Best wishes,

Ray Bantow.

An introduction to managerial economics

Topic 1

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Introduction

In this topic we introduce you to economics by considering some fundamental economic concepts. These concepts will help you to understand the importance of economics in the analysis of the behaviour of organisations and individuals involved in the production and consumption of goods and services. We will concentrate on introducing the basic tools of economic analysis in the context of rational choices on how resources are used. We look at the valuation of costs and benefits and how they influence decisions in society on a range of matters as diverse as what price to charge for a car and what environmental policy our governments should pursue.

The fundamental economic concepts we will concentrate on are choice and scarcity, economic resources and their returns and the concept of opportunity costs. As well as introducing these fundamental concepts, we consider the use of basic graphical and numeric tools in the analysis of economic issues. These tools include demand and supply curves, and the production possibilities frontier.

Objectives

At the end of this topic you should be able to:

- offer a definition of economics;
- use a production possibilities frontier to explain why economic scarcity and choice are the basis of economic study;
- describe the general nature of the economic environment in which firms operate;
- define opportunity cost and explain its importance in economic analysis; and
- use basic graphical and numerical techniques in the analysis of economic problems;

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 1 and 2.

Reading

Reading 1.1
M. Pusey
‘The impact of economic ideas on public policy in Canberra’

Part A: Some fundamental economic concepts

What is economics about?

Below are some examples of definitions found in textbooks.

> Economics is a study of men as they live and move and think in the ordinary business of life. (Marshall 1920, p. 14)
>
> Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses. (Robbins 1935, p. 16)
>
> Economics is the study of how people and society choose to employ scarce productive resources, which could have alternative uses, to produce various commodities, and of the distribution of these commodities among people and groups. (Samuelson, Hancock & Wallace 1975, p. 5)
>
> Economics is about conserving scarce things, and producing more of the scarce things. It's about choosing—about deciding which scarce things to conserve the most and which to produce the most—which to save, and which to use, and for what. (Bowden 1977, p. 4)
>
> Economics is the study of how individuals and societies choose among the alternative uses of scarce resources to produce goods. (Miller 1979, p. 4)
>
> In its most fundamental interpretation, economics is the theory of making rational choices. (Dorfman & Norman 1980, p. 3)

From these definitions, what key points seem to come through? Jot down what seem to be the key words to you before reading on.

From the above definitions it is clear that economics is about choice in an environment characterised by scarce *resources. Resources* (or *inputs or factors of production*) are the means that are used to produce goods. Although thousands of different kinds of resources are used in the productive process, it is convenient to classify resources into two broad categories: *labour and nonlabour*.

- Labour resources represent human effort, both physical and mental, used in producing goods.
- Non-labour resources consist of:
  - *natural resources* such as land, water, trees, minerals and fuel; and

  - *man-made resources* (called *capital*) such as buildings, machinery, semifinished materials and business inventories.

Economic resources are both *scarce* and *versatile*. Resources are scarce relative to the amounts of the goods that are desired. They are also versatile in the sense that they can be combined in varying proportions to produce different types of goods. The ways these resources can be combined to produce output reflects the current state of technology.

Technology represents the society's pool of *knowledge* for transforming scarce resources into economic goods. Together with quantities and qualities of resources in existence, technology sets the upper limit on the amounts of goods and, thus, the level of satisfaction that a society can achieve. It is a dynamic variable in the production system, constantly changing through research and development efforts.

In this unit you will study and analyse the nature of the decisions that firms confront on how to make best use of the scarce resources available to them. For example:

- what level of output to produce;
- what pricing to charge;
- how much should be spent on advertising; and,
- is expansion in the factory likely to be profitable?

In this unit we will concentrate on applied microeconomics. Begg et al. define microeconomic analysis as that area of economic analysis that '... offers a detailed treatment of individual decisions about particular commodities'. (Begg et al. 2000, p. 13)

In studying how firms and managers behave in our international economic environment we will also have to consider macroeconomics.

> 'Macroeconomics emphasises the interactions in the economy as a whole. It deliberately simplifies the individual building blocks of the analysis in order to retain a manageable analysis of the complete interaction of the economy.' (Begg et al. 2000, p. 13)

☐ *Read Section 1-5 in Begg et al. (2000), pp. 13–14.*

In this unit we will only study macroeconomics in terms of its impact on firm-level decision making; the major emphasis in the program lies firmly in the area of microeconomics.

☐ *Read the introduction to Chapter 1 and Section 1-1 in Begg et al. (2000), pp. 3–6, for a discussion of the sort of issues that economics deals with. Also read Section 1-2 (pp. 6–9) for a discussion on resources scarcity. (The concepts of production possibility frontier and opportunity cost will be taken up in the next section of the notes.)*

Production possibilities frontier

Begg et al. (2000, p. 7) introduce the concept of a *production possibilities frontier* (PPF) as an analytical device to demonstrate the implications of scarcity. The PPF shows, for a two output world, the maximum level of output that can be produced given the current state of technology and level of resources, and efficient allocation of these resources. It is a simple but surprisingly versatile analytical device and you will probably benefit from spending some time considering its construction and applicability to the management of our economy.

Note that in Figure 1-2 (Begg et al. 2000, p. 7), the distance of the curve from the origin reflects the levels of resources available and the state of technology at a particular point in time. Society is confronted with a choice about where to apply its factors of production and therefore what level and mix of output to produce. Any point on or within the frontier is attainable but only those points on the frontier would be efficient in a production sense.

This point on productive efficiency is easily demonstrated. Consider point *G* in the diagram in your text. This point is not efficient in a production sense because it is possible to be at point *C* or point *D* with the same level of resources. These points are unequivocally superior to *G* because they return more of one output and no less of the other. For points along the frontier between *C* and *D*, society would receive higher levels of both Food and Film than are produced at *G*. Therefore, for any point inside the frontier like *G*, there is a range along the frontier that is clearly superior.

Shifts in the PPF curve

As more resources become available for use in production the curve shifts out. Similarly, technological progress as fuelled by research and development expenditures and education shifts the frontier out by expanding the effective stock of factors of production. The expansion of the production possibilities curve is important because it expands our consumption and trade possibilities.

The shape of the PPF curve

The shape of the PPF is also determined in part by the state of technology. The other factors that determine the shape of the frontier are the suitability of resources for use in the alternative enterprises (in this case Film and Food) and the concept of diminishing returns. Consider these factors in turn.

1. *Technological change* is seldom uniform in terms of its impact. It generally fosters the production of some forms of output more than others. Begg et al.'s curve in Figure 1-2 will become steeper if there is technological change that favours Food production more than Film production.

2. Factors of production are not uniform or homogeneous in terms of there *suitability for alternative production systems*. As you move more resources out of Film production into Food production (say moving from *E* to *D*), the first resources to shift will be those least suited to Film work and most suitable to Food production. This means there will be a relatively small reduction in Film production and a quite substantial lift in Food output. If we expand Food production still further (from *C* to *B*) we will now be shifting

resources out of Film production that are quite well suited to Film work but of little value in producing food. So Film production will drop substantially and Food production will only increase by a relatively small amount. This means the frontier is tending to flatten out as we move back towards the Food axis.

3. *The law of diminishing returns* (Begg et al. 2000, p. 6) means that if we have uniform factors of production, and we hold all of them other than one constant, an expansion in the use of this factor will result in more output, but the *increase in output* will become smaller with each successive expansion in the use of the variable factor. The concept of diminishing returns will be developed more fully in Topic 7.

I suggest to you that the law of diminishing returns would only be an important factor in explaining the shape of the PPF if there was only one factor of production and that factor was homogeneous in terms of its production potential. Neither of these conditions is necessary to construct and interpret a production possibilities curve.

The PPF highlights two important concepts—scarcity and opportunity cost:

- *Scarcity* is implied by the notion that given the level of resources available at a point in time, we cannot produce or consume outside the frontier. This means that if we wish to produce and consume more Film we must manage with less Food. This choice is driven by the scarcity of the factors of production and it is an inescapable fact of life.

- The PPF demonstrates the concept of *opportunity cost* by showing that the decision to expand the production of one good necessitates a reduction in the production of the other good.

Let's look at this concept a little further.

Opportunity cost

This concept is more precisely called 'alternative opportunity cost' which more clearly describes the concept. As we have seen above, when we make a choice we must forego alternative opportunities. Thus, the *real* cost of exercising a choice is the value of what could alternatively have been obtained by using the resources in their next best alternative.

Let's look at this concept a little further.

In terms of our discussion on Food and Film, the opportunity or economic cost of expanding Film production is a loss of Food production.

What is the opportunity cost to you of spending time now to study this unit?

Question 1.1

Decisions by business organisations and governments can also be 'costed' in this way.

- The steel a firm uses to build tractors cannot be used to build motor cars, refrigerators, ships or farm sheds.

- Proclamation of a new national park means that mining, lumbering, construction and so on may not occur there.

- The decision to develop one product may preclude the firm from developing another.

From an economic as opposed to a tax accounting perspective, when evaluating an action or project all resources should be valued at their opportunity cost. If you are planning to build and sell a car *with all purchased inputs*, the opportunity cost of the resources used in that car are represented by the monetary value of those individual resources. The opportunity cost of hiring a worker for $100 is $100. That is, if you had not employed that worker you would have $100. So the economic cost of the car is just the sum of the resource costs involved in building the car. You should build the car as long as the return you are offered is greater than the sum of the opportunity cost on the resources.

Now consider the case where you have a stockpile of unsold cars that each cost $10,000 to build. The opportunity cost in planning production was $10,000 per car, what is it now?

In evaluating offers for cars out of the stockpile the true opportunity cost is what you could get for the car if you sold it to another outlet or at another point in time or the next best alternative price. If you are offered $5,000 for a car and you do not anticipate higher bids from other buyers or a recovery in prices some time in the future, it makes sense to sell the car for $5,000.

Have you made a loss? You have certainly made a loss on the manufacture and sale of the cars taken as a whole but you have not made a loss on the disposal of the cars from the stockpile. The act of selling the car for less than the construction cost was rational and profit maximising. This is the classic liquidation sale we are all familiar with.

How do we cost inputs that are not purchased but supplied by the owner of the business (e.g. the owner's labour and management)? Although the firm has not explicitly paid for these inputs they still should be charged at their opportunity cost. In this case the opportunity cost is the return the owner would have received if she had used her time and skill in her next best alternative occupation or venture. The next best alternative use may have a very high value (perhaps an executive in a large corporation) or it could be very low (for example unemployment benefits).

We see the principle of opportunity cost being applied countless times in the day to day actions of small and large businesses and consumers. Sometimes the principle is applied, following detailed financial analysis; sometimes in a purely intuitive fashion. For example, when market conditions deteriorate in the small business sector many firms close.

Those firms that stay are characterised by the following:

- they have are very good management and staff and they make more money than the average firm; and/or

- the owner operators have a low opportunity cost on their labour; and/or

- the owner operators derive a greater than average level of non-financial satisfaction from operating the business.

The people making these decisions have generally not heard of the term opportunity cost, but they certainly take them into account in the decisions they make.

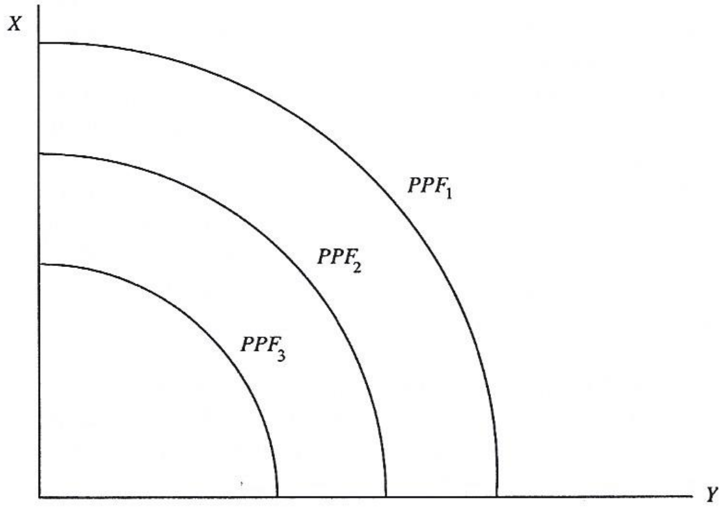
Sometimes a monetary valuation of the alternative opportunity cost may be relatively easy, at other times it is not and this will effect accuracy of the estimate used. Managerial decision makers need to assess the implications of erroneous estimates when deciding how to value resources. Sometimes the added cost of precision in estimates is justified, other times it is not. But this is not an argument for not making the estimates.

Application: Sustainable production

In 1987 the World Commission on Environment and Development published the Brundtland Report (World Commission on Environment and Development 1987). A major recommendation coming from this report was that countries need to focus on sustainable development rather than economic growth. They defined sustainable development as '... development that meets the needs of the present without compromising the ability of the future generations to meet their own needs' (World Commission on Environment and Development 1987, p. 8). The concept of sustainable development was picked up world wide by policy makers. In Australia the Federal Government commissioned a series of reports on how to incorporate sustainable development into industry management systems.

There has been considerable debate about the nature of the changes to industry and government policy that are necessary to achieve something approximating sustainable development. The 'Green' camp have effectively argued that our current levels of production and consumption are not sustainable into the future. They suggest that these levels have only been achieved by the mining of our resource base. This case is portrayed in terms of the production possibilities frontier in Figure 1.1 with two goods, *X* and *Y*.

Figure 1.1: Production possibilities frontier and sustainable production



The 'Greens' are suggesting that while we are on PPF_1 now, we will inevitably fall back to PPF_3 as we are converting renewable resources into consumption goods and using up non-renewable resources at too rapid a rate. They suggest that some changes in production and consumption patterns would enable us to operate on a sustainable curve like PPF_2. This curve would provide a reasonable level of consumption now and into the future. The alternative according to this group is a short period on PPF_1 but then we limit ourselves and future generations to PPF_3. This group points to the finite level of resources such as oil and coal, the rapid growth in world population levels and current pollution and waste management problems to support their case.

Others in society disagree with this view. Many of these suggest that technological change and appropriate government policies have made it possible to move the production possibilities curve out to PPF_1. They suggest that more research and cleverer policy formulation will make it possible to sustain PPF_1 or even shift the frontier out further. This group supports their view by pointing to the surplus of food production in the developed world, the continued expansion in our technical knowledge and the impact that changes in resource prices have had on the resources sectors.

Although the production possibilities frontier does not reconcile these differing views it at least provides an analytical framework that can be used to analyse each case.

Allocative mechanisms

While the PPF helps us to conceptualise the issues surrounding production it does not specifically guide as to what mix of goods should be produced. Any point along the frontier is feasible and equally efficient in a production sense. The decision on how to allocate the factors of production between the range of possible uses requires judgements on the relative values of the resultant outputs.

☐ *Read Section 1-3 in Begg et al. (2000), pp. 9–11 (note the last paragraph preceding Section 1-3 on p. 9).*

The discussion of generic allocative mechanisms was a popular area for academic debate prior to the collapse of the Soviet system. It has now been replaced by the study of *transitional economics* or how to move centrally planned economies towards market-based systems in the most appropriate way. There is really no debate now about the superiority of the basically market based economy over a centralised command economy. The real debate now is about just how far and fast economies should move down the road towards greater reliance on the market. These questions are being addressed in both the west and the former centrally planned economies. Even in China, industry 'reform' is the major economic issue at the present time.

In this unit we spend a considerable time on analysing how firms and industries behave in a market system. In topics 10 and 11 we will focus on the issue of when government intervention is appropriate and what form it is likely to take and should take.

At this stage it is important to realise that no economists suggest that there should be no government involvement in the running of the economy. The debate is about just how much intervention there should be and what form it should take.

Two approaches to economics

While dealing with the issue of debates in the economic profession it is worth considering the issue of disagreement in the economics profession on policy issues.

Begg et al. (2000) characterises this disagreement as one between positive and normative economics.

☐ *Read Section 1-4 in Begg et al. (2000), pp. 10–11.*

You might like to peruse your local newspaper for economic articles. Can you identify positive and normative statements?

In Australia at least, one of the major criticisms levelled at the economics profession is that there is a dominant view on microeconomic policies. This dominant view has come to be associated with the term economic rationalism.

Critics of the economics profession have argued that there is not enough debate amongst economists about important industry policy issues. Pusey (1991), in a following article to the one above, has argued that this is a reflection of the common and narrow training that most economists receive. Moreover, in studying the industry policy process he found that people who did not have that training and background were largely excluded from the policy processes in Canberra. His argument, and the argument of many over non-economists, is essentially that there is not enough disagreement and debate on these normative issues. They believe that economists just don't disagree enough.

Naturally, most economists are in total agreement in rejecting Pusey's claims. At the end of this unit you will be in a better position than you are now to pass judgement on this debate.

☐ *Turn to Reading 1.1 for an exploration of this issue.*

This article was written in 1990. Do you think Pusey's criticism of the top public servants then as just as valid today? How would you have responded to the questions posed in Table 1?

On a related issue, Begg et al. (2000, p. 12) claim that *normative economics* offers recommendations based on value judgements. Normative economics involves assessing what *ought* to happen. Sometimes this form of analysis does involve value judgements, but not all the time. For example, take the question of whether a government *should* provide protection to an industry through import quotas. The first step in evaluating this policy is to identify what the government's objective is. Let's say the objective is to sustain the industry at a certain level of employment. Objective economic analysis can show that this objective can be met in a lower cost way by using other measures of assistance such as tariffs or subsidies. The conclusion of the economic analysis would be that government *should not* provide quota protection. If it wants to provide protection there are lower cost policy instruments available.

Perhaps the important point to draw here is that we need to make a distinction between the *formulation of policy objectives* (which often involve value judgements) and the *analysis of policy instruments* that can be used to achieve these objectives (which generally need not involve value judgements).

The economic environment

The way firms make decisions and determine the strategic directions they take depends in part on the total economic environment in which they operate. The key characteristics of this environment reflect the basic nature of the economic system in which they carry out business, the state of the macro economy and the nature and extent of government regulation and control.

In this unit we are assuming firms operate in a mixed economy where most goods and services are delivered by private firms. Governments provide some goods and services but also play an important role in raising taxation and conducting macroeconomic policy and regulating the operation of private firms. The success of managers in formulating strategies and implementing decisions will be influenced by their ability to analyse the implications of both current and likely future government policies for their firm. Consider the following examples of the importance of government policies in firm-level decision-making.

- Anticipation of downturns in economic activity due to changes in macro policy can assist firms in formulating accurate sales forecasts for consumer durables;

- Firms considering investing in a highly protected market such as confronts the car industry, need to evaluate likely changes in government regulations and tariff policies to be able to form an accurate assessment of likely future profitability.

- Firms involved in production processes that produce substantial pollution levels need to evaluate likely future environmental regulations in formulating production plans.

- Major companies that are contemplating mergers or takeovers will invariable analyse the likely attitude of the relevant trade practises or anti-trust regulators.

The analysis of how and why governments implement economic policies is a critical area in the study of firm level decision making. In this unit you will study the basic principles underpinning macroeconomic policy in topics 4, 5 and 6 while the issue of government regulation is analysed in topics 10 and 11.

Part B: Graphs and basic numerical techniques

The study of business economics requires the frequent use of graphs and simple arithmetic. In the topics that follow you will learn to draw and interpret supply, demand, revenue and cost curves. You will also learn how to apply average and marginal values in a decision-making framework.

☐ *Read Chapter 2 in Begg et al. (2000).*

Those of you who have problems in interpreting graphs and charts should spend some time on Chapter 2 of Begg et al. (2000) and the appendix at the end of this topic before going on to Topic 2. Those of you with a more quantitative background can probably just skim this material.

From your reading of Begg et al. (2000), make sure you understand the relationship between 'data' and 'model', the value of indices (index numbers—can you think of a number commonly used in Australia?), and the difference between real and nominal values.

Some of the material in Chapter 2 (sections 2-5 and 2-6, pp. 21–22) will be returned to specifically in Topic 4 of this unit.

A number of problems in business economics can be tackled using calculus. However, as many students in this unit have a limited background in maths, we have designed this course to allow the study of the key issues and concepts underpinning managerial economics, without reference to the tools of calculus.

Students with some background in maths, or perhaps just an adventurous spirit, may benefit from reading a text with a mathematical orientation and going beyond the set work in each topic to look at the problems that require calculus. Your tutor will be more than pleased to provide you with guidance if you wish to go down this path. However, you will not be assessed on your ability to apply calculus.

Jargon

It is probably appropriate to say something about an issue the economic profession is famous for—the use of jargon. To a subject specialist, jargon is valuable. Precisely defined terms enable specialists to communicate more easily. Therefore jargon can aid in the formulation and solutions of problems. Jargon can also be taken to extremes so that the outcome is mumbo jumbo and there is no effective communication. (Perhaps this is sometimes done deliberately in the hope that the reader will conclude 'I can't understand this so it must be profound').

It is not our desire to confuse you. We shall try to minimise jargon; however, some jargon is inevitable and desirable. One problem with economic jargon is that some of the terms are in common use but are defined differently and precisely by economists. A couple of examples will illustrate the point.

> *Capital* is, to most people, money. To an economist capital is *not* money, but goods and services used in production. This includes both physical capital (plant and equipment) and human capital (skills, knowledge and ability).
>
> *Investment* to most people means spending money in the expectation of acquiring an added amount. To an economist investment is the acquisition of resources that will be used in the production of additional goods or services. Thus an 'investment' on Golden Lady in the 3.30 pm race is not *economic* investment. Building a new factory is economic investment. So too is completing a post-graduate degree.

Summary

In this introductory topic we have laid basic foundations for your study of business economics. We have done this by covering a number of fundamental matters such as choice, scarcity and opportunity cost. We have also stressed the importance of graphs as a basic economic tool and made extensive use of the PPF. While introducing these basic concepts we have also done one other important thing—we have introduced you to the process of economic analysis.

In the next topic we will study how markets operate and introduce two additional concepts—supply and demand.

Review questions

Review question 1.1

Economics is about choices: what to produce, how to produce it, and for whom it is produced. For each of the following cases consider which of the three basic questions are of relevance:

(a) the discovery of substantial reserves of natural gas on the North West Shelf;

(b) a change in the structure of income tax, such that income is redistributed from rich to poor;

(c) the privatisation of the power industry;

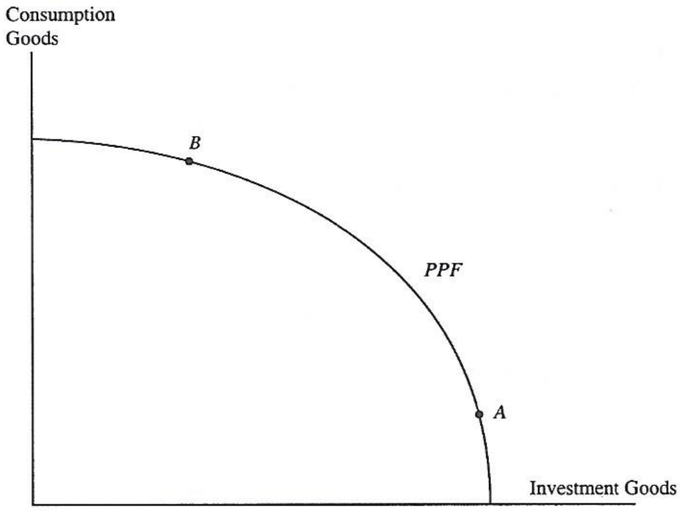
(d) the invention of the microcomputer; and

(e) an increase in the price of imported cars.

Review question 1.2

An economy can choose between producing goods to be consumed now and producing investment goods which have an effect on the future

productive capacity of the economy. This case is illustrated in the following figure.



For this economy, what can we say about the position of the frontier in subsequent periods? Explain how your answer is affected by the particular choice point selected in a given period (say Point A compared with Point B).

Review question 1.3

Devise a simple economic model to analyse the demand for school lunches at the local school cafeteria.

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Appendix: The use of graphs in economics

Introduction

☐ *This appendix should be read after you read Chapter 2 of Begg et al. (2000).*

Much of the economic analysis to be found in this unit requires that we keep track of two or more variables simultaneously. For example, in studying the demand of the market, we want to keep one eye on the price of the commodity and the other on the quantity the consumers are willing and able to buy. Such quantitative relationships can be described in a variety of ways: words, equations, tables or graphs. The use of graphs plays an extremely important role in economic analysis because graphs enable our eyes to take in, at a glance, relationships that would be far less apparent from lengthy prose or seemingly complicated equations or long tables of numbers. Thus, this appendix is designed to help you familiarise yourselves with the construction and interpretation of graphs in economics.

The rest of this appendix is structured as follows. Section 1 explains the basic elements of a graph, while Section 2 discusses the meaning of a functional relationship. In Section 3 we show you how to plot a graph from a theoretical relationship or from empirical data. Sections 4 and 5 focus on linear and non-linear functions, respectively, and Section 6 briefly considers the concept of slope.

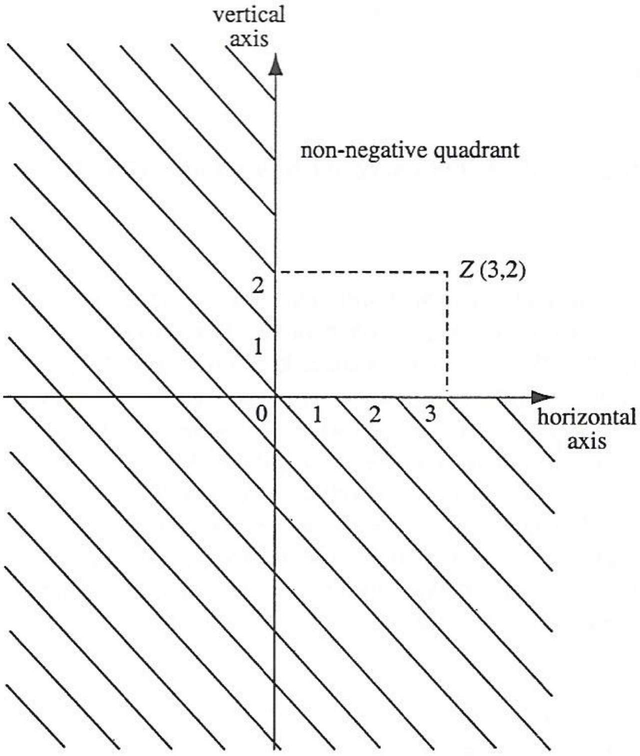
1. Basic elements of a graph

An ordinary two-dimensional graph starts out with two reference lines (called *coordinate axes*). The point at which the *horizontal* and *vertical* axes intersect is called the *origin* and usually denoted by 0 (see Figure A1 below). A convenient point on the horizontal axis is chosen to the right of 0, and its distance from 0 is called the *unit distance*. Similarly, a convenient point along the vertical axis and above the origin 0 is chosen to mark the vertical unit distance. On the horizontal axis, all values above the origin are positive, and all values below the origin are negative. The origin 0 designates zero for both horizontal and vertical values. It is clear the vertical values of all points lying on the horizontal axis are zero.

Similarly, all the horizontal values lying on the vertical axis are zero.

Now, each point in this plane corresponds to a unique *pair of numbers* (a,b) where a and b represent the signed distances from the vertical and horizontal axes, respectively. For example, Point Z in Figure A-1 which lies three units to the right of the vertical axis and two units from the horizontal axis can be described by (3,2). Since economic variables are typically non-negative, we usually focus on the upper right-hand (north-east) *quadrant* where both a and b are positive or zero.

Figure A-1: The two-dimensional coordinate system



2. Functional relationships

A two-variable functional relationship is simply a rule which associates with each element x in a set X *one and only one element* y in the set Y. The x variable is called the *independent (explanatory)* variable and the y variable the *dependent (explained)* variable. We usually denote a function by:

$$y = f(x)$$

For example, suppose that a public utility company supplies electricity at \$0.15 per kilowatt-hour. Let Q denote the annual quantity of electricity sold measured in millions of kilowatt-hours and R the company's annual sale revenue in millions of dollars. We can write $R = 0.15Q$

It is often useful to describe the above relationship using a table such as the following.

Note that Q is the independent variable, and R the dependent variable.

Table A-1: Sales revenue at different quantities sold (Hypothetical data)

Label in figure A-2	*Q*	*R*
0	0	0
A	10	1.5
B	20	3.0
C	30	4.5
D	40	6.0
E	50	7.5

3. Plotting a graph

A graph is simply a geometric representation of a function in a coordinate system. The steps involved in the construction of a graph from a function or a table are as follows:

Step One: Label the axes correctly

Returning to our example we can now label the horizontal axis as '*Q*, millions of kilowatt-hours per year' and the vertical axis as '*R*, millions of dollars per year'. Mathematical convention is that the *independent* variable is plotted on the horizontal (or '*X*'-axis) and the dependent variable on the vertical ('*Y*'-axis).

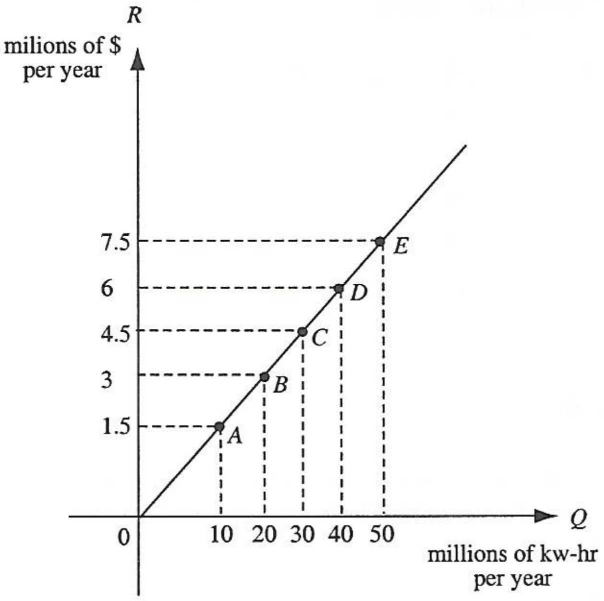
Step Two: Choose suitable units of distance

The choice of suitable units of distance depends on the ranges of the variables. In our example we divide the horizontal axis evenly into five units, each representing increases of 10 millions of kilowatt-hours. If our horizontal axis is, say, 12 centimetres long then a reasonable choice is 2 centimetres per unit. A similar choice applies to the vertical axis.

Step Three: Mark the points in the table

The next task is to find the points on the coordinate system that correspond to the six pairs of values given in Table A-1. Note that we have labelled these pairs of numbers *O*, *A*, *B*, *C*, *D* and *E* in Figure A-2. For combination *A*, we first move right along the horizontal axis to the point equal to 10 (millions of kilowatt-hours per week). We then move directly upward from that point until we are opposite to the point on the vertical axis that represents an annual of 1.5 millions of dollars. This is Point *A*. We use the same procedure for the remaining points.

Figure A-2: Revenue function



Step Four: Plot the graph of the function

Finally, the graph of the utility company's annual sale revenue is obtained by drawing a smooth line that connects points 0 through *E*. In our example, the graph of the revenue function turns out to be a straight line passing through the origin.

There are several things to look for in reading a graph. The most important feature of a graph is whether it slopes downward or upward as we move to the right. The graph in Figure A-2 slopes upward indicating that there is a *positive* or *direct* relationship between Q and R. If the graph slopes downward, then it indicates a *negative* or *inverse* relationship between the variables being studied. The second thing we should notice is the rapidity with which the line or curve being sketched runs uphill or downhill as we move to the right.

Before proceeding any further, it is important to note the economic convention of drawing graphs in economics. Mathematical orthodoxy requires us to draw the independent variable on the horizontal axis and the dependent variable on the vertical axis as explained above. However, in demand-supply analysis we adopt the tradition of plotting the independent variable (price) on the vertical axis and the dependent variable (quantity) on the horizontal axis.

4. Linear functions and straight-line graphs

In many economic applications, we often assume that the true relationship between the variables can be approximated by a *linear function* of the form:

$$y = a + bx$$

where a and b are some real numbers. In the example from Section 2 ($R = 0.15Q$ depicted in Figure A-2), the relationship between Q and R is linear where $a = 0$ and $b = 0.15$. The graph of a linear function is obviously a straight line which can be determined by two separate points on the plane.

It is often easy to use the two points where the line cuts the axes, i.e. Point *U* on the horizontal axis where $x = -a/b$ and $y = 0$ and Point *V* on the vertical axis where $x = 0$ and $y = a$. Now, the slope of a straight line is simply the ratio of the vertical change to the corresponding horizontal change as we move along the line. For example, using points 0 and *A* in Figure A-2, we have:

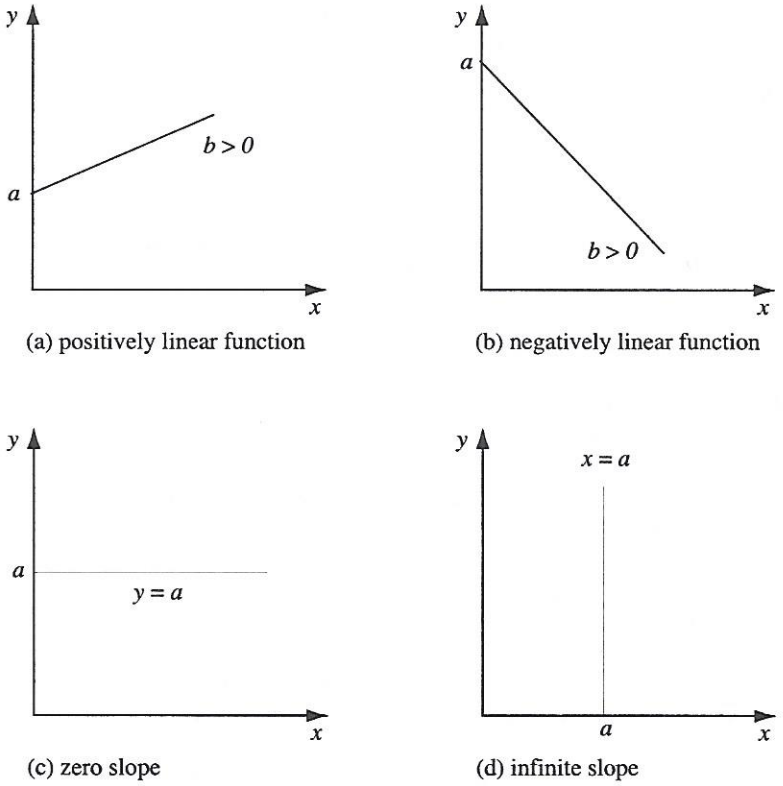
$$\text{slope of } OE = \text{change in } R/\text{change in } Q = (1.5)/(10 - 0) = 0.15 = b.$$

A number of points deserve mention:

(a) The slope of a straight line is everywhere the same. In Figure A-2, it does not matter which two points are used to compute the slope of the line. Its value is always equal to 0.15.

(b) The slope of a straight line can be either *negative, positive, zero* or *'infinite'*. The four panels of Figure A-3 show all possible cases. In graph (c), the horizontal line $y =$ constant has a zero slope (vertical change is zero) and, in graph (d), the vertical line $x =$ constant has an infinite slope (horizontal change is zero).

Figure A-3: Possible general forms of linear graphs



(a) positively linear function

(b) negatively linear function

(c) zero slope

(d) infinite slope

(c) The slope of $y = a + bx$ with respect to x is clearly b. However, if we plot x on the vertical axis as in some economic graphs, the slope of the line will be the slope of x with respect to y and equal to $1/b$. In

Figure A.2, if Q is plotted on the vertical axis, then the slope of the resulting straight line will be 10/0.15 = 6.67.

5. Non-linear functions and curves

If y cannot be put in the form $a + bx$ then y is said to be a *non-linear* function of x. The graph of a nonlinear function is called a *curve*. *Curves also have slopes, but the numerical value of the slope is different at every point.* The slope of a curve at a particular point is the slope of the straight line that is tangent to the curve at this point. In Figure A-4, we have constructed a curve with a positive but decreasing slope. The slope of the curve at Point A is given by:

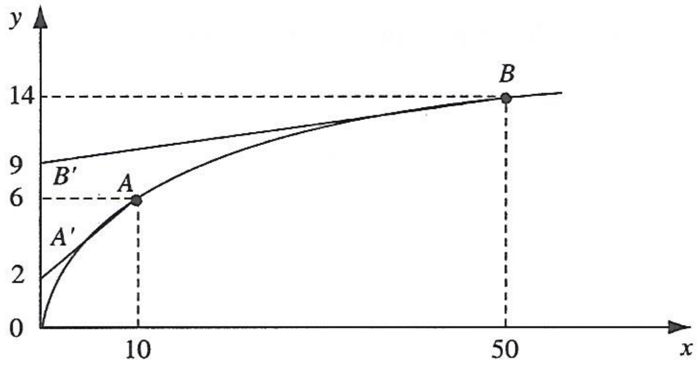
$$\text{slope at Point } A = \text{slope of } AA' = (6 - 2)/(10 - 0) = 0.4$$

A similar calculation yields the slope of the curve at Point B

$$\text{slope at Point } B = \text{slope of } BB' = (14 - 9)/(50 - 0) = 0.01$$

which is smaller than the slope at A.

Figure A-4: A non-linear graph



There is a close connection between the shape of a curve and its slopes as illustrated in Figure A-5:

(a) Slopes are positive and increasing as x increases: the curve is rising and convex.

(b) Slopes are positive and decreasing as x increases: the curve is rising and concave.

(c) Slopes are negative and increasing (i.e. becoming less negative) as x increases: the curve is falling and convex to the origin.

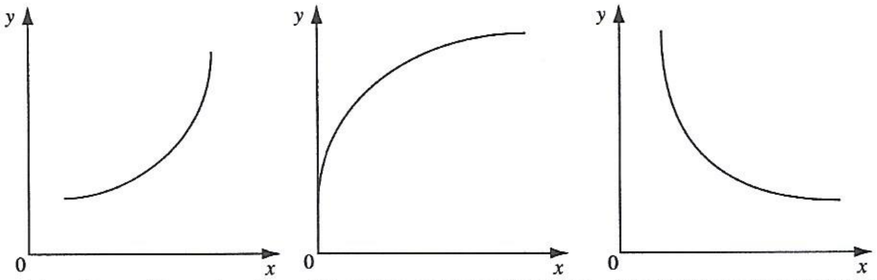
(d) Slopes are negative and decreasing (i.e. becoming more negative) as x increases: the curve is falling and concave to the origin.

(e) Slopes are positive then negative as x increases.

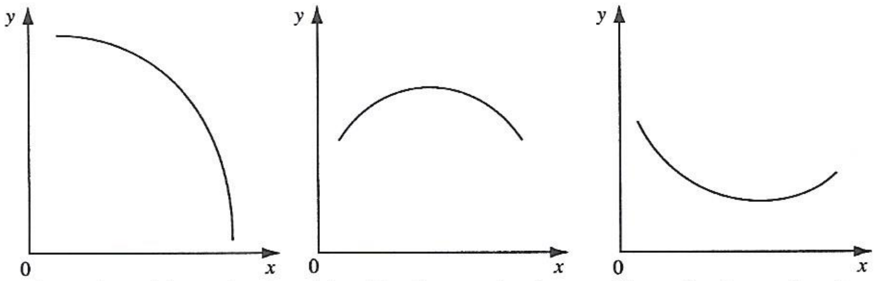
(f) Slopes are negative then positive as x increases.

6. The slope of a relationship

Figure A-5: Non-linear graphs



(a) positive and increasing slope (b) positive and decreasing slope (c) negative and increasing slope



(d) negative and decreasing slope (e) positive then negative slope (f) negative then positive slope

While it is relatively easy to identify the slope of a straight line, the derivation of the slope of a non-linear curve is slightly more complex because the slope is constantly changing as we move along the curve. (We saw this in Figure A-4—the slope at *A* was different from that at *B*.) This case is illustrated in Figure 2-6 of Begg et al. (2000, p. 24).

It is sometimes useful to be able to represent the slope of straight lines or curves in an algebraic form. The notation that is used is the Greek symbol ∂ (delta) representing 'change in'. (∂ is usually used when referring to small changes. For larger changes, the capital delta — Δ — is used.)

Suggested answers

Topic 1

In-text questions

Question 1.1

The opportunity cost to you of studying this topic depends on the next best alternative use of your time. It could be making more money by working overtime or earning commissions on additional sales you could make. It could also be the satisfaction you derive from watching The Simpsons on TV or listening to good CD. It all depends on the options available to you and the value you derive from those options.

Review questions

Review question 1.1

(a) *What*—resources will be diverted away from other production opportunities into this new project?

How—will developers of the project choose between alternative technologies?

For whom—the target market would have to be investigated to establish if the development would be financially viable at this point in time.

(b) *What*—demand is likely to shift away from goods consumed by the rich towards goods consumed by the poor? The demand for charity services is likely to decline.

For whom—more goods and services will be consumed by the poorer people in society and less by the higher income earners.

(c) *How*—privatisation is likely to change the way the power industry operates with greater emphasis on efficiency.

For whom—depending on what regulations remain, some groups may not be as well serviced as in the past e.g. rural consumers.

(d) *What*—shift of resources into the microcomputer industry and other industries that would benefit from this development.

How—major changes in the production technology in a number of industries that can now use the microcomputer.

(e) *What*—resources are likely to move into the domestic production of cars and out of the importing of cars and car 'service' industries

Review question 1.2

In this case we are considering an economy over time rather than at a point in time. The more resources we devote to investment goods in period one:

* the greater is the potential expansion in the PPF in Period 2;

* the lower is Period 1 consumption; and,

* the higher is the potential consumption in Period 2.

Review question 1.3

The quantity of school lunches purchased would be a determined by a number of factors including of the price of lunches, the number of students at the school, the income of parents, the time of the year.

The model could be expressed as follows:
$QL = f(P, Y, N, S)$

where

QL = quantity of lunches purchased
P = price of lunches
Y = income of parents
N = number of students at the school
S = time of the year.

The impact of economic ideas on public policy in Canberra[1]

Reading 1.1

Michael Pusey*

In an excellent paper on 'The Political Ideology of Australia: the Distinctiveness of a Benthamite Ideology' presented by Professor Hugh Collins to the American Academy of Arts and Sciences' Daedalus Symposium on Australia, one finds an assessment of Australia's universities that was true even before the current 'rationalisations' of the Australian tertiary education system. I quote him as follows …

> The universities, which have codified and certified useful knowledge, have been mostly post-Darwinian creations … positivism has reigned, almost without challenge, in science, law, philosophy, history, economics, and the social sciences. The secular, 'engineering' character of Australian tertiary education is nowhere more evident than in the professional separation from humanities and social sciences achieved by law and economics. The autonomy of law and economics faculties has been to the detriment of each and at the cost all, since they supply the graduates who chiefly govern the nation.[2]

It is within this context that we should being to situate some of the distinctive characteristics of our top Canberra public servants and of their attitudes to public policy.

Some ten years ago, the Aberbach's six nation study of Bureaucrats and Politicians in Western Democracies[3] showed, firstly, that top public servants are key brokers in the destiny of nations and, secondly, that nothing remains of the old presumption that elected politicians choose the values of state action and that the bureaucrats select only the neutral means for its implementation. And, thirdly, it demonstrated that top bureaucrats are centrally involved with ministers and elected politicians not only in implementing policy but also in its formulation and, equally, in the brokerage of interests and the articulation of national ideals and goals.

Viewed both from an historical and an international perspective the most distinctive feature of our Canberra Senior Executive Service (SES) today is its high concentrations of economists. In 1986, according to my own study[4] based on a sample of 215 interviewees, some 71% of the SES staff of the three 'central agencies' or 'coordinating departments', were economists.[5]

Some of the historical reasons for this national eccentricity are clear. Ours is a very young Commonwealth Public Service with an identity that was formed during and after the last war by the great reformer economists of the H.C. Coombs generation who so ably served both Liberal and Labor governments through to the Fraser years. It is perhaps because Australia was so well served by these men that we have assumed that a newer generation of economists would follow in their footsteps and bring similar intellectual skills and norms to the policy and management process. That is not what has happened and the easy assumption of continuity, of 'more of the same', misses the change in the character of modern economics that now so sharply distinguishes one generation from the other.

Coombs and his contemporaries *were* generalists and they *did* take what pubic servants call the 'broader view'—and they were plausibly, and like most of the Aberbach's top bureaucrats, 'committed centrists'. They were also nationalists and they typically had some historical memory of the Great Depression, of unemployment and economic crisis, of war, and of ordinary life in rural and urban Australia long before anything was done to the Queanbeyan River. As one of our eminent historians points out, those with a pre-war university education, one that was usually hard-won at night-school, were formed by what was then a liberal educational curriculum.

They:

> had to learn other things besides economics. If they studied the social sciences, those sciences were typically presented as means to improve the world. Improving the world required equal attention to ends and means, and the ends as well as the means of social reform got generous attention in the curriculum.[6]

This is not at all the experience of our present day central agency SES economists with a median age of only forty years in 1986. They would typically have studied economics in the early and mid 1960s after the transformation in the economics curriculum that Professor Butlin dates at about 1947. As Butlin's study shows by then the situation was already very different. It was:

> After the date, economics became much more technical and specialised—one might say, summarily, Americanised and more attuned to rational maximising behaviour. Increasingly this training seemed to prefer efficiency to humanity. In this new and tougher guise, some 50,000 graduates emerged between 1947 and 1986.[7]

This new specialised business-oriented technology had nothing to do with national public policy. Even the people who trained them, including Professors John Nevile and Max Corden,[8] among others, agree with the judgments of Butlin, and of Stretton, who sees in this training a 'deadly combination of positivism and specialisation'. Not surprisingly then we find that our economist SES officers followed a university economics curriculum in the early 1960s that would, especially if they were good honours students, concentrate on methodological, quantitative, formal and technical economic problems and exclude any broadening study of Australian history, of sociology or Australian society, of the history of ideas, of philosophy or administration and the law.

This immediately raises the 'so what?' question. Does the character of a university education gained in one's early twenties still have any effect in shaping attitudes to public policy some ten to twenty years later? The surprising finding of my own study is that is *does* and, further, that it is in fact decisive and an even more powerful predictor of orientations to policy and management than such other variables as age, socio-economic status, schooling, years of service in the Public Service, seniority in the SES, and perhaps even gender,[9] to name but a few. We therefore have proof that narrowing specialisation at university is crucial, that is does not 'go away' or broaden with later experience, and that it has lasting effects in forming orientations towards policy and management.

That this is the case and that anti-social policy attitudes have been led by our economists is clear enough from the data in Table 1. We see that those with an economics background are twice as likely as the others to say that the distribution of the nation's income is biased to wage and salary earners and that nearly three-quarters of the economists, as compared with a thin majority of the more liberally(?) oriented humanities/social science/law group, approve of the deregulation of the labour market. From both ends of the range it is clear too that the economists are more than twice as likely to say that trade unions have more power than business interests. Again we begin to grasp how much has been lost in this 'organised forgetting' of structural social inequality and social democracy from responses showing that only 29% of those in the second group of 'liberals' believe that relations between capital and labour are less than benign and so, on balance, more unequal and exploitive than they are complementary and equal—only half as many of the economics graduates, and this means 17%, and thus less than one in five of them, could bring themselves to agree with this view that market relations are exploitive.

In any public service there is an inherent risk that the career structure and the promotions system will be captured by powerful minorities within the service and then used, wittingly or unwittingly, to promote more of their own kind. The evidence suggests that this has happened in the SES from as far back as 1982 and that the promotions system is a 'cornered market' that gives cumulatively disproportionate power to the younger technically oriented economists in the central agencies of Treasury, Finance, and PM&C.

From 1982 to 1986 officers in those three departments were more than twice as likely to climb the promotion stair two steps, or 'jumps', at a time than were their counterparts in our other two sample groups of (a) the market oriented departments,[10] and (b) the programme and service departments.

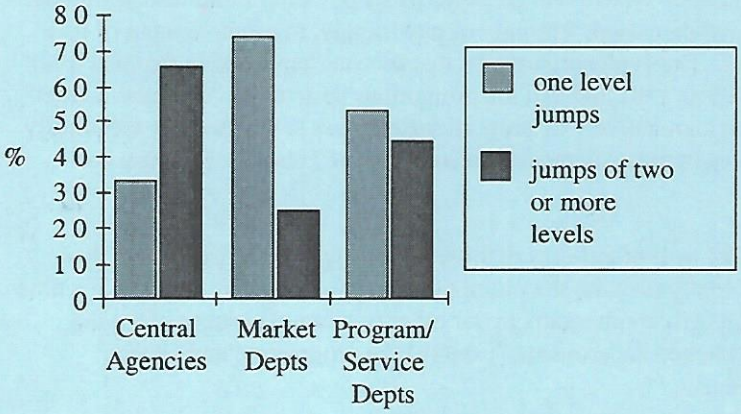
Table 1: **Responses to four policy orientation questions of (a) SES officers with economics/business oriented university education, and (b) SES officers with university education in humanities/social sciences/law**

	Econ./Business %	*H./Soc. Sci./Law* %
1. In Australia today would you say that the distribution of Gross National Product is:		
biased to wage and salary earners …	45	27
balanced …	29	17
biased to capital …	25	56
	(n = 106)	(n = 48)

2. With respect to the deregulation of the labour market do you:		
approve …	72	53
disapprove …	28	47
	(n = 115)	(n = 51)
3. In general would you say that trade unions have:		
less power than business interests …	13	26
both are more or less balanced …	39	48
more power than business interests …	41	24
no answer …	7	2
	(n = 116)	(n = 54)
4. In a developed and fairly affluent society like ours, the relations between capital and labour are:		
more complementary and equal than they are unequal and exploitive …	61	41
more unequal and exploitive than complementary and equal …	17	29
these categories are no longer particularly relevant (why not?) …	22	29
	(n = 108)	(n = 51)

Entries are percentages. $x^2<0.05$.

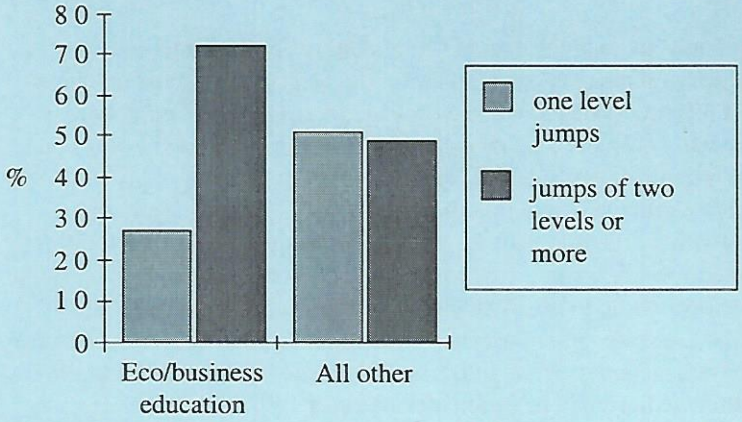
Chart 1: **Promotion to and within the senior executive service 1982/1986 inclusive, compared by department categories**



(Central agencies, N - 152, Market depts, N - 66, Program and Service depts, N = 126.)

From the data represented in Chart 2 we see that the economists are at least 20% more likely to climb the promotion ladders two or more steps at a time than are those with any other type of degree.

Chart 2: Promotions to and within the senior executive service 1982/1986 inclusive. Economics/business graduates compared with all other educational backgrounds



(Eco./Business, N = 124; All other, N = 268.)

In this generation we are alone in the world as never before and our maturity is being put to the test as we measure the capacity of our institutions to withstand the ravages of an economic 'rationalism' that is little more than an ideological convulsion and a primitive throwback to the irretrievable and exhausted earlier moral cultures of two nations, Britain and the United States, the two 'stateless societies' par excellent, whose institutions were laid down before the factory, before the industrial revolution, and, more pertinently here, before we in Australia learned (or did we?) to make social democracy work by vesting the ultimate responsibilities for the distribution of national income in, what was here, our nation-building state. If the temper of our present day top bureaucrats is any measure we do not seem to be showing very well on this test of our experience and resolution in the defence of the distinctive characteristics of our own nationhood. The 'rationalisation' of Canberra points to a retreat that is visible from at least three points as follows.

In the first place Australia's social welfare system is especially vulnerable. Even before the cuts that began in 1985 and 1986 we already had the most underfunded and poorly developed welfare system of the western OECD countries.[11] As other observers have noticed, the Australian welfare system is so vulnerable now to still further strangulation because of our reliance on a different instrument of social justice, namely an arbitration system that is oriented to the distribution of *primary* income rather than to a secondary and compensatory redistribution of incomes claimed as entitlements from the state.[12] And so we must live with the bitter irony that in Britain welfare provisions will stand as *entitlements,* even in the fire of Mrs Thatcher's breath, whereas here, Australian laborism has left women, families, and now the unemployed men as well, with all the vulnerabilities that come from mortgaging the dignity of the male breadwinner's labour to the authority of a state over the labour market. The results of this study show, first, that there is no longer much support for our welfare system among those very people, our senior bureaucrats, who were assumed to have the value commitments,[13] the expertise, and even, according to a wholly mistaken theory of the 'New Class', a certain vested interest in its development—the one in six or so of our larger

Senior Executive Service sample who pass as social democrats were found to be the most demoralised and now most likely to be pushed out of the Service. And, secondly, these results indicate, more ominously, that the dominant central agency economists are blind even to the economic costs of the permanent underclass that their policies will produce.

A second new and major threat to social democracy in Australia turns more directly on the precarious future of the wages system and on the policy of offering tax cuts in place of wage increases. The point here is that social and political democracy in Australia has depended always on what we might call the 'integrity' or even the 'relative autonomy' of the state. Max Corden has said that the incomes policy of the Menzies era was governed by the rule that 'no significant group's income shall fall if that of the others is rising'.[14] My point is that even if there was then some moderate opposition to this policy from what was, at that time, a fairly Keynesian Treasury[15] there was no serious risk that such opposition could split the state apparatus from within and sink the wages and arbitration system that we have had in various forms since 1907.

Today this improbable risk is now closer to a fait accompli. A Treasury led deregulation of the dollar and financial markets in 1985, of which 92% of all my respondents approved, has produced a situation where the Australian dollar is now (in relation to the size of the national economy) the most heavily traded currency in the world and known among the speculators simply as the 'Pacific Peso'. As the currency goes up and down on the markets (rather like Marx's levitating tables and chairs), so also does Australia's credit rating and the further consequences that, as an editorial in the *Sydney Morning Herald* puts it:

> … under certain circumstances a few words from Roger Nye … can press the button that blasts the Hawke Government out of office.[16]

Roger is the Australian specialist for Moody's Investor Services, the US credit rating firm that first cut Australia's credit rating from AAA to AA1 in 1986.[17]

And what were those 'certain circumstances'? Even in 1986 it was clear that the deregulated dollar and the credit rating[18] would fall … and interest rates would rise … and the government would fall … if the Industrial Relations Commission stopped discounting real wages in line with each new 'fall' in the value of the dollar. In other words the government would fall if the Industrial Relations Commission stopped giving the lie to its historic 'mission' of redistributing national income more equitably than its would-be competitors, 'The Market'. This virtual capture of the state's authority over the labour market has been paid for with tax cuts that have been used both to cushion and to strategically delay the effects of an upward redistribution of the nation's income on ordinary wage and salary earners. Moreover, this has, certainly in the short to medium term, irreversibly reduced whatever state revenues might otherwise have been available for welfare, health, education, and other social and community services. By the time the 'sleepers awake' to close the stable door the horse will have bolted.

Closely inter-related with both the welfare and the wages system is a third bulwark of social democracy in Australia, namely industry policy. What the SES study has shown here is that the policy makers and program managers in the market-oriented industry departments such as Primary Industry, Trade, Resources and Energy, and Industry Technology and Commerce, have in many respects suffered nearly as badly from the central agency economists have the social service departments. The staff of these market departments and the domestic manufacturing enterprises of which they have a very close working knowledge have, historically, acted as a counterweight against the financial community and, more recently, the multinationals, who view labour costs merely as reducible prices and high unemployment rates and social misery as the measures of good economic planning. As everyone knows the very considerable authority of the state in Australia has, in contrast to the most successful corporatist economies of Scandinavia and Western Europe, depended here not only the genuinely tripartite co-operation of labour capital and government that is the rule in those countries, but rather on the capacity of the state to use both the wages system and industry protection to hold the ring for the rival claimants, and even to play them off against each other. It is only against this well-understood background that one can properly appreciate the threat to social democracy of the so-called 'level playing fields' approach in the name of which the Department of Industry Technology and Commerce and the Industries Assistance Commission have fallen under the control of the treasury doctrines.

With that said it is clear that I have deliberately put the cart before the horse. Welfare provision, a regulated labour market, and support for industry are no more than three aspects of the structural context of social democracy in Australia that we have taken somewhat for granted precisely because they seem to be cemented into what one might loosely call the 'constitution' of the Australian state. But of course there are no historical guarantees and the problem in Australia at the moment is that the legitimations for all three dimensions are being eroded under our noses and with astonishing speed. Indeed, weakening legitimations take us to the heart of the problem because the erosion of political and social democracy in Australia today is, at root, a failure of civil society and, in this sense, a cultural and intellectual failure.

The failure is evident in the fact that with the exception of a courageous few, professional politicians and senior bureaucrats no longer believe that the political process is or ever could be governed, even at the margins, by morally binding interpretations of social needs. Almost everything that happens in Canberra today is premised, as the results show, on the assumption that there is a hierarchical order of reality and causation that gives primacy to the economic system qua system, and second place to politics and the political system, and third place to a residual view of society that is seen a some kind of stubbornly resisting sludge that variously inhibits and obstructs 'the economy'. In short, society is assumed—and I think this is a momentously important regression—to be not the *subject* of politics as it must be if citizenship, liberal democracy, and social needs are to have any meaning, but instead as the *object* of politics.

The failure of moral and intellectual culture is the public service is inescapably related to a broader failure in Australia of liberal education and, perhaps, of national identity. In the bone marrow of the Coombs generation there was always the assumption that every policy proposal must, in principle at least, be intellectually grounded in some coherent view of society and of the human condition. If is the failure of liberal education in Australia that has allowed arbitrariness to turn what looks to the outsider like the major part of modern economics into a game of strategies to help the 'strategic visionaries' of the business world 'win' against an idealised opponent that is now society itself. The equation of utility with, in the very broadest sense, welfare, has led us into a series of reductions, namely that:

- needs reduce to wants;
- social welfare reduces to the welfare of individuals;
- the individual is the self-sufficient judge of his/her own welfare;
- the welfare of individuals cannot be compared.[19]

Inasmuch as the market is made the arbiter of all values, the ground has been cut away from under the liberal politic of social democracy. That is why the new right is 'thin skinned and bad tempered about its legitimacy'.[20] A self-referential doctrine cannot negotiate or qualify its own premises. It is for this reason that the dominant economists in public service now define trade unions, and what they call the 'welfare lobby', as 'vested interests'—that was the view of about two-thirds of my Canberra respondents as early as 1985 and 1986. Reality has been stood on its head as the market has been made a surrogate for universal values and universalistic norms and procedures of allocation, and thus for social justice and, indeed, for intelligent deliberation. Claims that are grounded in social reality, or worse that appeal to equity, will be treated as partial special pleading and as vested interests, that conspire to distort the market—a successful redistribution of national income based on a social claim is a 'market failure' improperly allowed by a state bureaucracy that is, as the central agencies constantly say of the program and even the market departments, 'still too close to its clients'.

Like any other self-referential doctrine economic rationalism will fail under the pressure of realities that it cannot grasp. On the one hand it must fail in the face of a finite environment that it can only conceptualise as an exploitative resource or as a 'generic externality'. On the other side it will pay the price of casting society itself both as the object of business strategy and, just as negatively, as the generic source of all 'market failure'.

It is a reduction that does not see that in the space of only a generation extended family, church, and local community neighbourhood have all been burnt up as fuel in the engine of economic 'development': it goes on, now, to assume that all social relations, social norms, and traditions; that culture and remembered inheritance, and all the institutions of education, of the family, of work, of political participation, and indeed the social formation of ordinary individual identity—that all this is malleable plastic that will obediently find expression merely as individual calculations of utility co-ordinated through a market—and what is more, through a market that will then handle it all 'efficiently and effectively' within whatever strictures of 'reduced complexity' and 'overloaded system' will allow. What nonsense!

Since the market is not animal, mineral or vegetable it must be a social construction that is symbolically produced from out of society itself. We know that all modern or developed nation-societies have two co-ordinating structures—markets and states. In the extraordinary collapse of one empire we have, over the last year, witnessed what is in effect the revolt of civil society against a system in which one co-ordinating structure, the state, had become autarchic. Anyone with a passing knowledge of the other great modern empire, the United States, cannot fail to notice that there, too, civil society, ordinary culture, and identity are showing signs of great stress—2,500 people were murdered in New York alone last year. One glance at the displays in the local video store should suffice to point to the consequences of ceding autarchy to the other co-ordinating structures, the market. 'Take from the individual all that is Society,' said Rousseau, 'and you are left with only blind sensation.'

In the words of one distinguished American comparative historian we, in Australia, were 'born modern' believing:

> that the state, far from encroaching upon individual rights would be the most likely protector of rights against other agencies of social coercion. Australians believed that the major constraints on individual liberty were not public, but private.[21]

If we are to survive what is euphemistically called the global economy we need more Australian economists with a will to protect this legacy—but this time without the binding positivism.

* University of New South Wales. Paper to 19th Conference of Economists (Australia), The University of New South Wales, September 1990.

End notes

1. This is a modified version of a chapter in *Social Democracy and the Social Sciences: Essays in Honour of Sol Encel,* A. Daniel (ed.), that is to be published in early 1991 by Longman Cheshire. The matters discussed in this paper are dealt with more fully in the book, M. Pusey, *Economic Rationalism in Canberra: A Nation-building State Changes its Mind,* that will be published by Cambridge University Press in early 1991.

2. Hugh Collins, ''The Political Ideology of Australia's in Australia: The Distinctiveness of a Benthamite Society'', pp. 147–171 in *Australia: The Deadalus Symposium,* Stephen R. Graubard (ed.), Angus and Robertson/American Academy of Arts and Sciences, 1985.

3. Joel D. Aberbach, Robert D. Putnam, Bert A. Rockman*, Bureaucrats and Politicians in Western Democracies*, Harvard University Press, Cambridge, Mass., 1981.

4. The Canberra study was conducted with the support of an ARGS grant. The sample of 215 SES officers interviewed between May of 1985 and October of 1986 comprises nearly half of the total SES population in the 13 departments studied and approximately one seventh of the whole SES population.

5. In the whole sample of 215 SES officers 44% held degrees in economics or commerce and a further 3% with degrees in accountancy and another 7% with degrees in business administration are included in this category of economists — so also are those economists who graduated with an Arts degree and/or otherwise designated themselves as economists. For the SES as a whole, according to Public Service Board figures, in 1986 25% of the SES held first degrees in economics (i.e. B.Ec., or B.Com.), however, this does not account for the many officers who were trained as economists and who hold B.A. degrees.

6. Hugh Stretton, *Political Essays,* Georgian House, Melbourne, 1987, p. 202.

7. N.G. Butlin, 'Human or Inhuman Capital? The Economic Profession 1916–87', Department of Economic History, Research School of Social Sciences, Australian National University, Working Paper no. 91, Sept. 1987.

8. Some of Prof. J. Nevile's comments are in my book, *Economic Rationalism in Canberra: A Nation-building State Changes its Mind, op. cit.* See also Max Corden, 'The Rule of Technique: The Economic Record in Recent Years', in the *Australian Economist, 1898–1988,* (eds) N.G. Butlin, V.W. Fitzgerald and G.H. Scott, Facsimile edition, vol. 1, ANU Press, pp. xiii–xiv.

9. I deal with some of the methodological problems of adequately addressing the gender question in my book. Since there was such a small proportion (approximately 6%) of women in the SES at the time and such a proportionately small number of 18 females in my sample of 215 randomly selected SES officers in the 13 departments under study, a male/female breakdown of the responses could not be done without revealing the identities of the respondents. Another decision had to be made: either load the sample with more women to increase the numbers to a point where statistical comparisons could be done meaningfully or else stay with the 'natural'(!) numbers. Faced with this choice it seemed wise to make a content analysis of the 18 female interviews so as to form a judgement as to whether the women would, even in these proportions that were below statistical significance, respond differently from the men. It was clear, overall, that cross tabulations by gender would probably show no significant differences in policy orientation and so, accordingly, it was decided not to alter the sample or scale the numbers.

10. In these market-orientated departments the SES has, more understandably, a similarly high concentration—about 71%—of economists.

11. The *Role of the Public Sector,* OECD Economic Studies, no. 4, Spring 1985.

12. F. Castles, 'Australian and Sweden: The Politics of Economic Vulnerability', *Thesis Eleven,* no. 16, 1987, pp. 112–122.

13. Heclo, Aberbach *et al.* and Rohr, among others, found that top public servants were variously 'committed centrists' and social democrats.

14. Corden as quoted in Castles, *op. cit.*

15. See Greg Whitwell, *The Treasury Line.* Allen and Unwin, 1986.

16. Editorial, *Sydney Morning Herald,* p. 10, Tuesday, 3 Jan. 1989.

17. Editorial, *Sydney Morning Herald,* p. 10, Tuesday, 3 Jan. 1989.

18. The very notion of a national 'credit rating' is little more than a potent ideological fiction inasmuch as there is no 'independent' assessment of a nation's net assets or of any of the real factors—natural and social resources—upon which its 'income' or 'wealth' might depend.

19. Daniel Bell, 'Model and Reality in Economic Discourse', in Daniel Bell and Irving Kristol (eds), *The Crisis in Economic Theory,* Basic Books, New York, 1981, p. 56.

20. It is Peter Steinfels who says originally that the 'New Class that is thin skinned about its legitimacy etc.' but if we are to properly read Michael Walzer's brilliant essay, Steinfels should have said this rather of the New Right. See Michael Walzer's essay on 'Nervous Liberals' in his collection, *Radical Principles,* Basic Books, 1980. The essay also appears in the *New York Review,* in 1986.

21. R. Rosecrance, 'The Radical Culture of Australia', in Louis Hartz (ed.), *The Founding of New Societies,* New York, Harcourt Brace, 1964, p. 310.

Source: *Economic Papers,* vol. 9, no. 4, December 1990, pp. 80–90.

The basics of demand and supply

Topic 2

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Introduction

This topic and Topic 3 are probably the most important topics in this course.

Consider the following questions:

- What is demand likely to be next month?
- If we increase price to $10 what will that do to sales?
- How will year's adverse season impact on market supply?
- If the government introduces full fees for university places what will happen to student numbers?
- What impact will higher child care charges have on the use of child care facilities?

At some time in your professional careers these or similar questions are likely to become important to you. The analytical framework developed in this and the following topic will help you to arrive at better answers to these questions.

The material to be covered in this topic encompasses much of the traditional analysis of the operation of the marketplace. We begin by studying in turn the demand and supply sides of the marketplace, and then combine them to illustrate the achievement of equilibrium. We show the importance of these concepts in the business environment through a number of applications of the theory to business and policy issues.

The instructional approach in this topic differs a little from that of our first topic. There are numerous questions for you to try along the way, and readings are interspersed with the study guide commentary. One of your major activities should therefore be to try to answer, from your own understanding, as many of these questions as possible.

Objectives

By the end of this topic you should be able to:

- identify the main determinants of demand in a market, and be familiar with the ways of presenting the demand function in graphical and algebraic form;
- identify the main variables determining the level of supply in a market, and be familiar with the graphical and algebraic forms of the supply function; and
- combine demand and supply functions to determine equilibrium market conditions, and analyse the impact of changes to and interferences with these conditions.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, Chapter 3.

Reading

Reading 2.1
P. Fuller & M. Stewart
'Attendance patterns at Victorian and South Australian Football games'

Overview of demand and supply

The discussion of demand and supply is central to any study of economics because it provides the basis to the understanding of how markets work. Markets exit for all goods and services: some are largely uncontrolled while others are highly regulated by governments. Markets bring producers and consumers together. In so doing they guide production and supply decisions on the part of producers and determine the basis for the allocation of goods and services between consumers. The efficiency with which markets perform these functions rests largely on the way prices are formulated and the study of this price formulation process is the ultimate focus of this topic.

To understand the price formulation process we need to consider demand for, and supply of, goods and services.

☐ *Begg et al. (2000, pp. 30–3) provides a useful background discussion to the notes that follow, and the concepts touched on above. Read these sections now.*

We start our discussion by considering the demand side of the market.

Demand functions and curves

The demand for a commodity refers to the various quantities of that commodity which an individual, or groups of individuals, would be *willing and able* to buy at different prices in a given time period. In this section we first examine the concept of demand as applied to an individual in society. We then show how the demands of individual consumers for any good or service can be aggregated to yield industry or market demand. In this analysis we use both *demand functions* (or equations) and *demand curves* to illustrate the concepts involved.

Individual demand

The quantity of a good or service demanded by an individual (q^d) depends on several variables. These include:

- the price of the commodity (P)
- the prices of other commodities ($P_1, \ldots, P_n$)
- the level of individual income (y)
- individual tastes (T)

There may also be other variables which determine demand in particular cases, but we will confine our attention to those just mentioned.

In functional notation we can then say

$$q^d = f(P; P_1, \ldots, P_n; y; T).$$

If we wish to plot an individual's demand function graphically, we assume all variables on the right hand side of this equation except one—the price of the commodity—to be constants, (the assumption of *ceteris paribus*), i.e.

$$q^d = f(P; \overline{P}_1, \ldots, \overline{P}_n; \overline{y}; \overline{T})$$

where the bar notation denotes a constant or variable determined outside this market (*exagenous* variables, as opposed to P and q^d that are *endogenously* determined). This means that effectively

$$q^d = f(P, C)$$

where C is some constant.

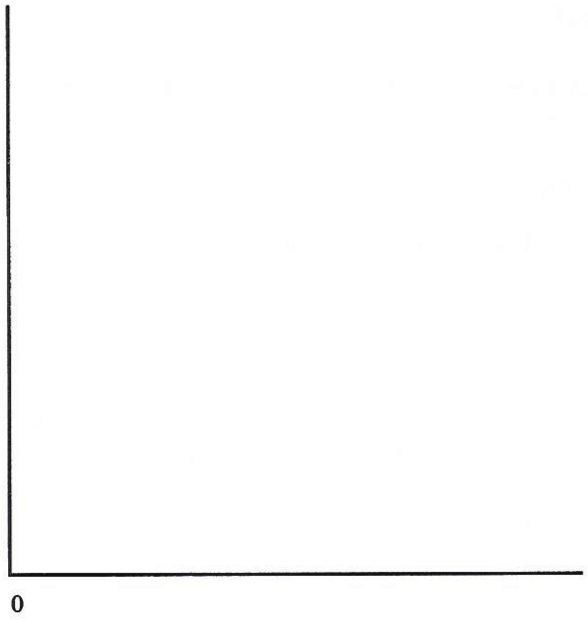
For example, the equation $q^d = 10 - 0.1P$ means that quantity demand is equal to 10 units less 0.1 of a unit for each increment in price above zero. The effect of all the factors other than P on q^d is reflected in the value of the constant term (in this case 10).

Normally we expect that the quantity demanded of a commodity rises as its price falls, and vice versa, other variables remaining constant.

By way of illustration, consider an individual's demand schedule for a certain hypothetical brand of beer—say Bunyip Bitter—over a month.

Price per 285 mL glass *$*	*Number of 285 ml glasses demanded per month*
0.20	60
0.30	40
0.40	28
0.50	20
0.60	15

Plot this on the following graph axes provided. Make sure you follow the economist's convention of putting price per unit on the vertical axis and quantity per unit of time on the horizontal axis.



You should have produced a downward-sloping curve from left to right in your diagram. You should have labelled the vertical axis 'price per 285 mL glass' and the horizontal axis 'number of 285 ml glasses demanded per month'.

Notice that from the demand schedule you have just drawn you can predict the individual's monthly beer consumption at prices within the range shown in the table, providing *all the other exogenous variables remain constant or ceteris paribus*. For example, if we were to charge $0.50 per glass this consumer would purchase 20 drinks per month. Another perspective on this curve is that it shows the maximum price we could charge this beer drinker for any supply covered by the range in the table , ceteris paribus. For instance, if we wanted to sell 40 drinks per month to this consumer we would not be able to charge more than $0.30 per glass.

Learning the law of demand the hard way

Mercury One-2-One is a British mobile-phone company. As a promotion to attract new customers, the company offered free telephone calls on Christmas to consumers who signed on between November 8th and Christmas Eve.

The company 'never dreamed its customers would be so generous in spreading the holiday cheer'. The promotion generated more than 33,000 hours of calls, jamming the network and prompting hundreds of complaints from people who couldn't get through to place their calls. The volume on Christmas was about 10 times the daily average. Many people placed overseas calls and simply left the phone line open, logging free international calls of up to 12 hours. The average call was about 1.5 hours long and the typical caller rang up about $60 in charge—equal to the average *monthly bill* of a cellular company in the United States. The promotion ended up costing the firm millions of dollars. One member of parliament has vowed to file a complaint with Britain's Board of Trade. To quote one executive of the company, 'There's certainly been insatiable demand'.

Source: Brickley, Smith & Zimmerman (1997), p. 66.

Now suppose that other variables *do not remain constant,* i.e. we relax our *ceteris paribus* assumption.

Changes or shifts in demand

If any of the other variables change, the demand schedule will normally move even if the price of the commodity remains constant. Let's consider change in three variables—prices of other goods, income and taste.

Changes in prices of other commodities

First let us consider changes in the prices of other commodities. In the context of this discussion we will divide other commodities into two groups: substitutes and complements.

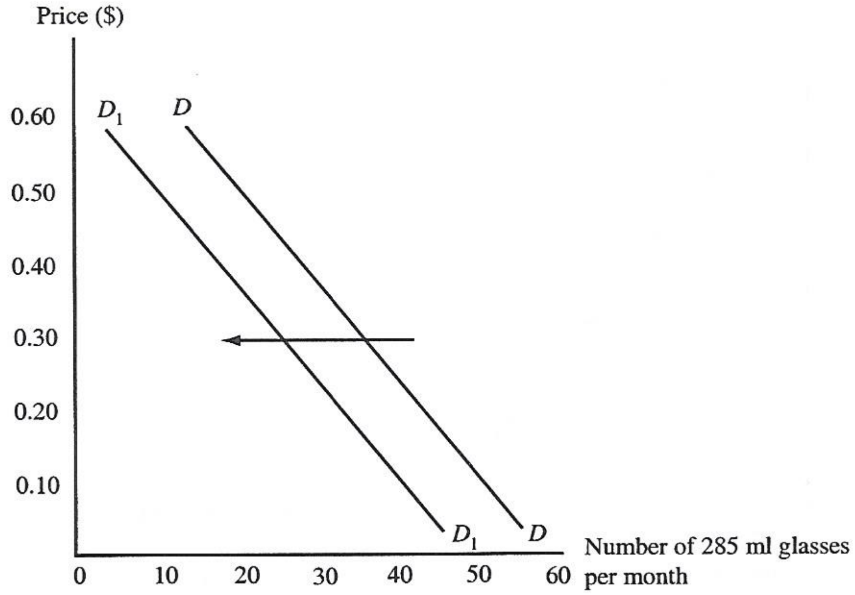
- A *substitute commodity* is one which acts or serves in the place of another commodity. Demand for a product will be positively related to changes in prices for substitute products. That is, demand for a commodity tends to rise if the price of a substitute rises, and falls when a substitute price falls.

  Examples of substitutes for Bunyip Bitter include other brands of beer, wine, spirits, soft drinks and water. Different people would list different substitutes.

  - If demand rises, the schedule (curve) will move up to the right, i.e. more of the commodity is demanded at each price and the intercept term on the quantity axis is higher.
  - If demand falls, the schedule will move down to the left, i.e. less of the commodity is demanded at each price and the intercept term on the quantity axis falls.

  For example, Figure 2.1 shows what will happen to an individual's demand schedule for Bunyip Bitter if the price of wine falls, assuming that he or she regards Bunyip Bitter and wine as substitute commodities. Movement is left (inwards), from *D* to D_1.

Figure 2.1: Movement in demand for Bunyip Bitter beer with fall in wine prices



- A *complementary commodity* is one which adds to or improves one's satisfaction from consuming another commodity.

  Examples of complementary commodities are bread and butter, milk and breakfast cereal, squash racquets and squash balls.

  – Demand for a commodity tends to rise if the price of a complementary commodity falls, and vice versa.

- Movements in the prices of goods which are *neither substitutes nor complements* for a commodity have no direct impact on the demand curve for that commodity.

Of course, if the second good makes up a very large share of your total expenditure, a rise in its price would effectively reduce your purchasing power or effective income. This effective reduction in disposable income may in turn reduce your demand for first good. These feed back or second and third round effects are generally very small for most goods and services so we will assume them away at this stage.

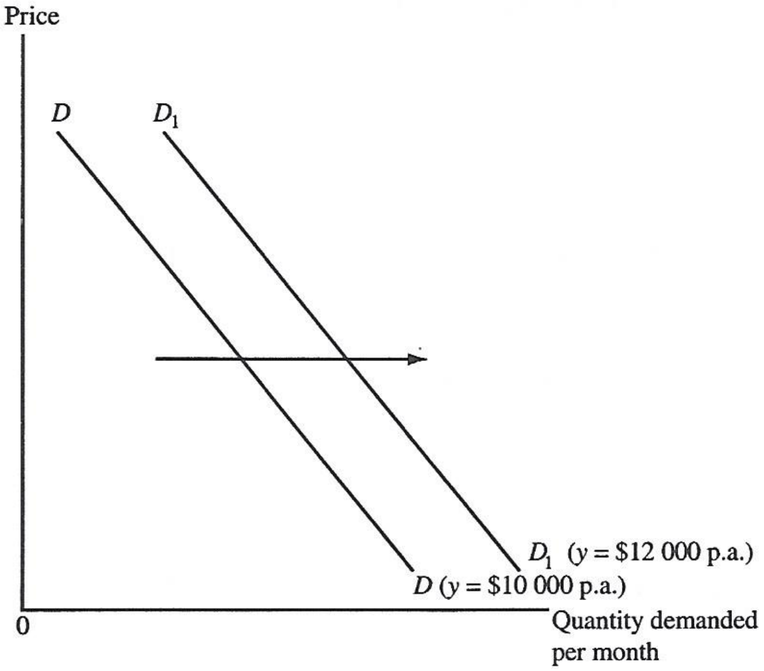
Think about your own buying behaviour. Jot down three products or services you have consumed recently and note any substitutes and complements for these items.

Note that your answers reflect your personal tastes and preferences.

Changes in income

Secondly, we consider changes in income. Normally, rises in income tend to be associated with rises in the quantity of goods demanded. Hence, we would expect a movement to the right in our demand curve. For example, if an individual's income rises from $10 000 per annum to $12 000 per annum we would expect his or her demand curve for beer to move outwards as in Figure 2.2 (i.e. from D to D_1).

Figure 2.2: Movement in the demand curve for beer with rise in income



The converse situation normally applies to a fall in income.

There are two possible exceptions to this argument:

- Commodities, such as staple foods, where variations in income have very little, if any, effect on the quantity demanded, e.g. salt and bread in Australia.
- Commodities where changes in income have the opposite effect on the quantity demanded. People may reduce there purchases of low priced brands of products as their incomes increase. Foe some consumers beer may fall into this bracket. Higher incomes may encourage them to reduce beer consumption and increase consumption of more expensive drinks.

Changes in taste

Finally we consider changes in taste. These changes occur for both psychological and biological reasons, and may be influenced by advertising. Some taste changes, e.g. in clothing, music, leisure activities, are temporary phenomena. Others are more permanent, e.g. the change from fountain pens to ballpoint pens. Clearly, changes in tastes may increase demand for some commodities—perhaps only in the short run—and decrease demand for others—again perhaps only in the short run. A widely reported change in tastes which has occurred in recent years in Australia has been reflected in strongly increased consumer demand for low cholesterol foods.

Economic scene: Champagne tastes*

Nearly a decade ago, the historic and staid champagne houses of France decided to change the image of their products. Slick and flashy promotional campaigns featured long-legged blondes and bubbly froth to lift champagne sales. Successfully. Sales increased by 75 per cent between 1982 and 1990, and exports doubled. Prices, of course, increased sharply. Premium champagne may cost more than $40 a bottle.

Such increases will, in all likelihood, provide greater profits to the champagne makers. But they describe their situation as regrettably being forced to ration shipments to clamoring retailers. Many people wonder why champagne houses do not increase production in response to the increase in demand. The reason is that the French government has limited the area where grapes for champagne can be grown. In an international agreement signed by many countries, but not the United States, only sparkling wines made in a specified region of France may be called champagne.

Even with fixed supply, the rising prices caused by the outward shift in demand will soon force quantity demanded to equal quantity supplied. The rising prices will motivate many customers to turn to respectable, less-expensive sparkling wines from California, Spain, Australia and Brazil.

In contrast to worldwide growth, champagne sales in the United States have declined in recent years. This drop reflects both growing antialcohol sentiment and the weaker dollar. With a decline in the value of the dollar relative to the franc, champagne prices are even higher in the United States. Not only has a growing distaste for alcoholic beverages decreased demand in the United States, increasing relative prices have also cut the quantity demanded.

* This vignette is based on Steven Greenhouse, 'Champagne taking an elite turn', *The New York Times*, Thursday, 18 October 1990.

Source: Solberg (1992), p. 50.

Can you think of another case where taste and preferences have changed substantially and this has had a substantial impact on quantity demanded?

Market demand

We now move from individual demand to market demand. This is the sum of the demands of all individuals in the marketplace.

As well as depending on all those factors which determine individual demand, it can be argued that market demand also depends on another variable—population size.

Hence we might write:

$$Q^d = f(P; P_1, \ldots, P_n; Y; Z; T)$$

where Q^d = total quantity demanded

Y = income of the total target market or target population

Z = size of the target market or target population

As for an individual, if we wish to plot a market demand curve graphically, we assume all variables on the right hand side of this equation except one—the price of the commodity—to be constants, i.e:

$$Q^d = f(P; \overline{P}_1, \ldots, \overline{P}_n; \overline{Z}; \overline{T})$$

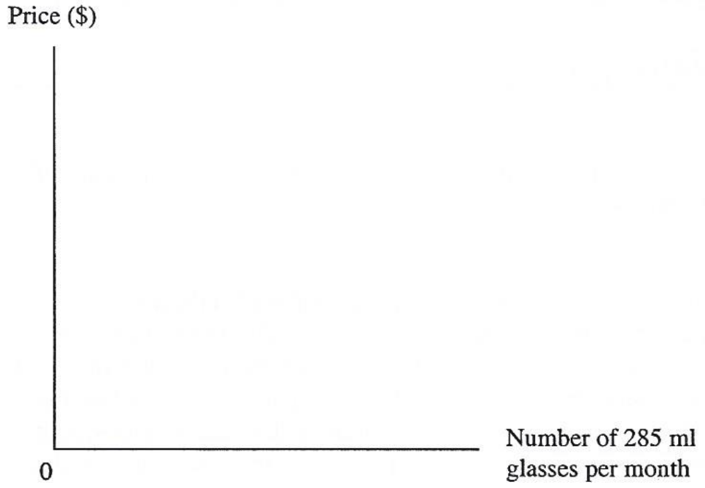
This effectively means that:

$$Q^d = f(P, C)$$

One can derive a market-demand curve by summing the demand curves of all individuals in the market place. Following our earlier example, we might find that the market-demand schedule for Bunyip Bitter beer over a month is:

Price per 285 mL glass $	*Number of 285 ml glasses demanded per month (millions)*
0.20	6.0
0.30	4.0
0.40	2.8
0.50	2.0
0.60	1.5

Plot this on the graph axes below.



Note that the scale on the horizontal axis has changed quite dramatically compared with the graph of individual demand, but the scale on the vertical axis remains the same.

In the same way that changes in the prices of other commodities, income and tastes cause shifts in the demand curve of an individual, changes in these variables as well as the size of the target or potential market population cause corresponding shifts in the market demand curve.

Question 2.1

Billabong Boomerangs Inc. and Swahili Spears are direct competitors in the fast-growing segment of the hunters' equipment market. Because of recent intense competition, both companies have redeveloped their main product, requiring the users' skills to be less developed than before and thus avoiding extensive field trips by company representatives for on-the-job training. This also reduced the need for costly instruction manuals. Stephen Pesner, president of Billabong Boomerangs, has decided to hire a local market research company to assist his company in planning its strategy. After extensive research using modern methods of data collection and statistical analysis, the researchers came up with Billabong's demand function:

$$Q_B = -1.700\, P_B + 750\, Y_H + 350\, A_B - 250\, A_S + 1.585\, P_S + 1.05\, H + 7.25\, W$$

where Q_B ***is the quantity demanded of boomerangs;*** P_B ***is the price of boomerangs;*** Y_H ***is the average income of hunters (in thousands);*** A_B ***is the advertising budget for Billabong Boomerangs (in thousands);*** A_S ***is the advertising budget for Swahili Spears (in thousands);*** P_S ***is the price of spears;*** H ***is the total number of hunters (in millions); and*** W ***is the estimated population of wildlife (in hundreds). The current values of the independent variables are***

$P_B = 29.95$; $Y_H = 12.5$; $A_B = 680$; $A_S = 525$; $P_S = 32.25$; $H = 24.68$; ***and*** $W = 8.75$.

(a) What is the current level of demand for Billabong boomerangs?

(b) Calculate the level of demand if advertising by Billabong Boomerangs was doubled.

(c) What factors would need to be considered in making a judgement about the desirability of doubling advertising expenditure?

Source: Douglas (1987), p. 151.

☐ *Read Section 3-4 and 3-5 in Begg et al. (2000), pp. 32–5, for a review of the concepts covered so far.*

We have now considered individual demand and market demand. It should be clear that individual demand is a reflection of the purchasing power of the individual (or ability to buy) and the relative attractiveness of this good when compared with other alternative purchases (or willingness to buy). Market demand is a summation of the individual demands, so it can be interpreted as a reflection of the potential size of the market and the relative attractiveness of the good to potential consumers.

Managerial challenge
Demand for public transportation

Port Authority Transit (PAT) provides public transportation services to the residents of Allegheny County (Pittsburgh and suburbs). It operates a fleet of 925 buses and 71 light rail vehicles and trolleys in providing nearly 90 million rides per year. In June 1990 PAT adopted a $173.7 million budget for the 1990–91 fiscal year. By state law PAT is required to operate on a balanced budget. PAT's cash base fare is $1.10. Fares cover only part of its costs—with the balance of its revenues coming from federal, state, and county subsidies.

As a result of the Persian Gulf crisis beginning in August 1990, the cost of diesel fuel (used to operate buses) increased from $.61 per gallon to $1.09 per gallon—which produced a projected $3.2 million budget deficit. (Each l-cent increase in the price of diesel fuel costs PAT more than $100,000 per year, because its vehicles use more than 10 million gallons annually.)

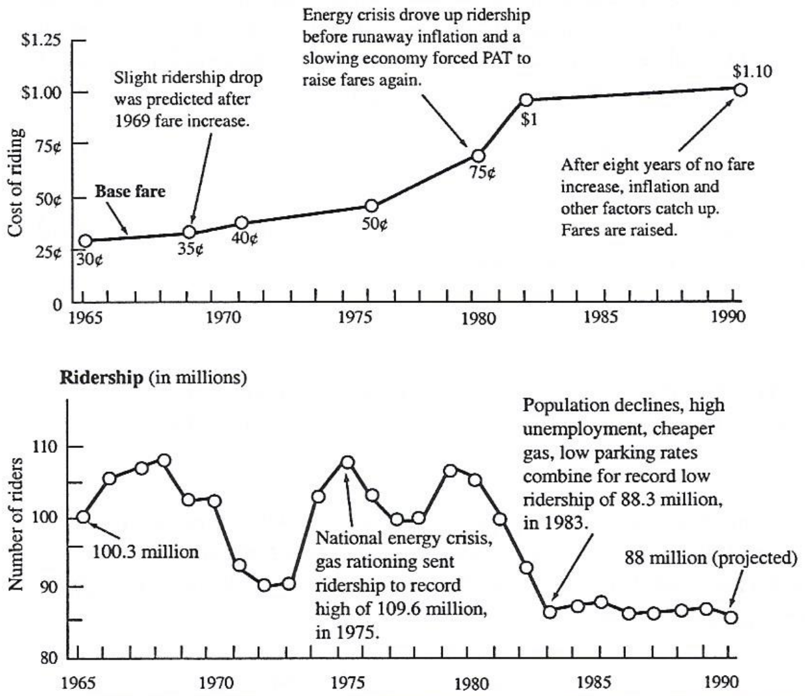
Faced with this projected deficit and the need to balance its budget, PAT could attempt to either reduce costs or increase revenues. Cutting costs is difficult because most administrative expenses (e.g., salaries) are relatively fixed in the short run. Likewise, hourly wage rates paid to drivers and mechanics are set by union contracts and cannot be lowered unilaterally. Service cutbacks are possible; however, this may also reduce revenues and thus be counterproductive. Instead of attempting to reduce costs, the executive director of PAT proposed a 15-cent increase in fares to offset the increased cost of diesel fuel.

In analyzing the effects of this fare increase, a number of issues have to be addressed. For example:

- How will the fare (price) increase affect demand and overall revenues?
- What other factors, besides fares, affect demand?

Examination of the data in the graph below gives some possible answers to these questions. Note that ridership declined every year (i.e., 1969, 1971, 1976, 1980, 1982, and 1990) that PAT raised fares. Note also that ridership increased during the mid to late 1970s when there were gasoline shortages and (relatively) higher gasoline prices. Finally, note that ridership declined in the early 1980s—a period during which there was higher unemployment, population declines, and (relatively) lower gasoline prices.

Mathematical models can be developed that incorporate price and other relevant variables in explaining demand for various goods and services. Such models can be used to make forecasts of demand (and revenues) based on the expected changes in any of the relevant variables.



Source: McGuigan & Moyer (1993), pp. 123–4.

There are two sides to every market. As well as demand for a particular commodity or resource, there must also be supply. We will now consider the supply side of things.

Supply functions and curves

In economic literature, the supply of a commodity refers to the various quantities of that commodity which producers are able and willing to offer for sale at various prices. As with demand, supply functions show quantities that would be supplied by producers over a given time period.

The quantity of a commodity supplied by producers to a market depends on several variables. These include:

- the price of the commodity (P);
- the prices of alternative production commodities ($P_1, \ldots, P_n$);
- the prices of resources or factors of production ($F_1, \ldots, F_m$);
- the state of technology (T_e); and
- random factors such as strikes and weather conditions.

In functional notation we can then say:

$$Q^s = f(P; P_1, \ldots, P_n; F_1, \ldots, F_m; G; T_e)$$

where Q^s = quantity of the commodity supplied to the market.

You should note that the same factors which determine market supply will also determine the supply function for an individual producer (such as a firm). If we want to plot a market supply function graphically, we again assume that all variables on the right-hand side of our equation except the price of the commodity are constants, that is:

$$Q^s = f(P; \overline{P}_1, \ldots, \overline{P}_n; \overline{F}_1; \overline{G}; \overline{T}_e)$$

where the bar notation denotes a constant or variables determined outside this market. This effectively means that:

$$Q^s = f(P, C)$$

As with demand curves, the market supply curve can be graphically obtained by summing the supply curves of individual producers.

Question 2.2

The table below gives the supply schedules of the three producers of commodity X in the market. Draw on a single set of axes the three producers' supply curves, and (by summing) derive the market supply curve for commodity X.

Quantity supplied (per unit of time)

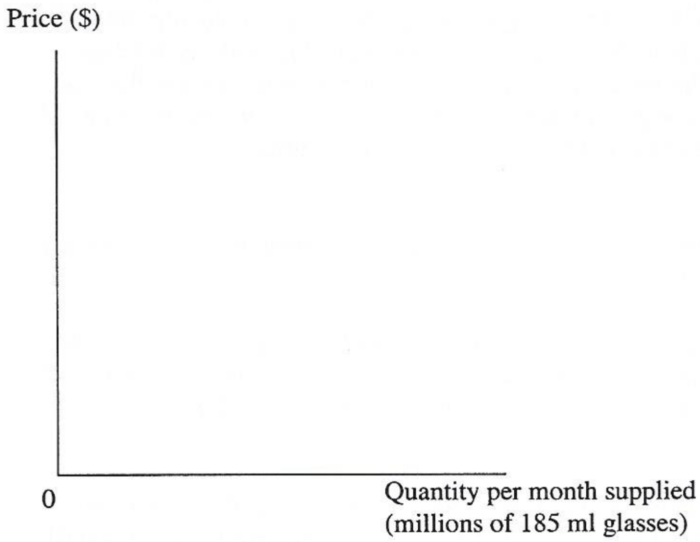
Pr($)	*Producer 1*	*Producer 2*	*Producer 3*
0	*0*	*0*	*10*
1	*0*	*0*	*25*
2	*0*	*20*	*35*
3	*10*	*30*	*42*
4	*16*	*36*	*46*
5	*20*	*40*	*50*
6	*22*	*42*	*53*

Normally we expect that the quantity supplied *rises* as the price *rises*, other variables remaining constant.

Continuing with the beer example discussed earlier, let us consider the market supply schedule for Bunyip Bitter over a month.

Price per 285 mL glass	*Quantity per month supplied millions of 285 ml glasses*
0.20	0.6
0.30	1.8
0.40	2.8
0.50	3.6
0.60	4.2

Plot this on a graph in the space below. Again make sure that you place price on the vertical axis, and quantity per unit of time on the horizontal axis.

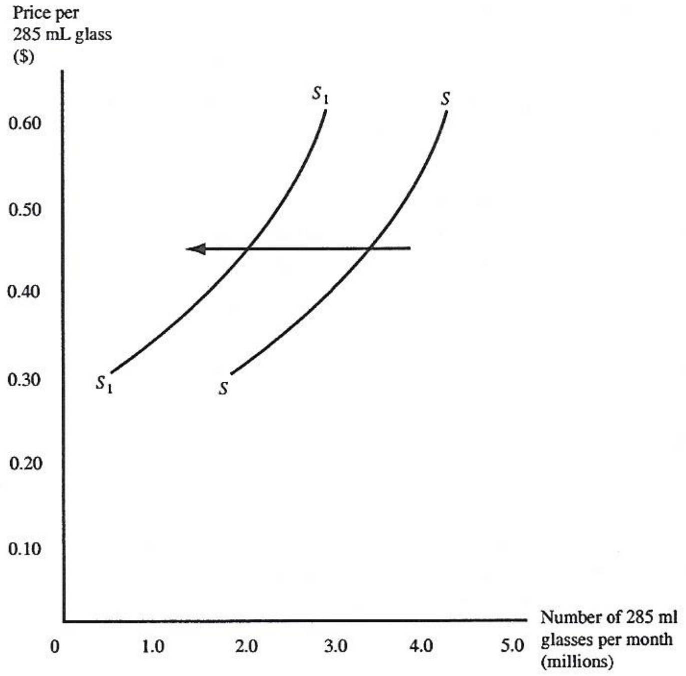


You should have produced an upward-sloping curve from left to right on your diagram.

Changes or shifts in supply

In the same way that shifts may occur in demand curves, they may also occur in supply curves, i.e. by the values of the constants (or exogenous variables) changing. Hence, in the Australian environment, if there is an increase in wage rates, in the brewing industry or nationwide, or if fuel and other costs were pushed up by external sources, the market supply curve may move to the left as in Figure 2.3 (from *S* to S_1), i.e. there is a decrease in the quantity supplied at each price.

Figure 2.3: Movement in the supply curves for beer



SS denotes the original supply curve, and S_1S_1 the new supply curve. If there were a new technological breakthrough which reduced production costs in the brewing industry, the supply curve would move to the right. There would be an increase in supply, i.e. producers would be willing to supply more of the commodity at each possible price.

☐ *Now read sections 5-6 and 5-7 in Begg et al. (2000), pp. 35–6, to review these concepts.*

Consider a good or service you are involved with supplying. Jot down what has happened to the total market supply of the good or service over the last 10 years and what factors have been responsible for that change.

Just as market demand can be viewed as a reflection of the size of the potential market and the relative attractiveness of the good to individual consumers, market supply is a reflection of the relative attractiveness of producing a good or service compared to other production possibilities.

Having established what drives demand and supply, we now consider how supply and demand interact to determine market prices and quantities and introduce the concept of a market equilibrium.

Equilibrium prices and quantities

According to Hirshleifer (1976, p. 19):

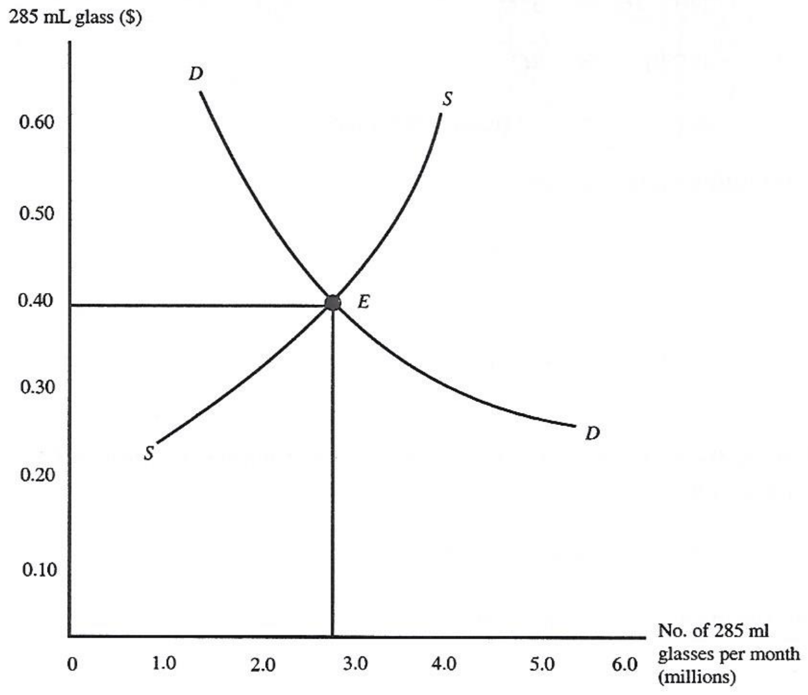
> Equilibrium is a property of the interaction of economic agents in markets. A system is in equilibrium when the forces acting upon it are so balanced that there is no tendency to change. When the price is such that the quantity supplied equals the quantity demanded, conditions are in balance and there is no tendency for price or for quantity to change—the market is in equilibrium.

To illustrate the achievement of this equilibrium, consider again our example of the demand and supply for beer. Let us incorporate the demand and supply schedules into one table as follows:

Price per 285 mL glass ($)	*Demand (million glasses per month)*	*Supply (million glasses per month)*
0.20	6.0	0.6
0.30	4.0	1.8
0.40	2.8	2.8
0.50	2.0	3.6
0.60	1.5	4.2

When we plot demand and supply curves graphically, as in Figure 2.4, we see that equilibrium price and quantity will be determined by the point where these curves intersect (given as Point *E*).

Figure 2.4: **Equilibrium prices and quantities in the market for Bunyip Bitter beer**



At prices of 20 cents and 30 cents per glass there will be an unsatisfied demand for beer. At prices of 50 cents and 60 cents per glass all demand will be satisfied and there will be an excess supply. Only at the price of 40 cents per glass will equilibrium conditions be met. At equilibrium those consumers who are willing and able to pay 40 cents per glass are satisfied. Such an equilibrium does not mean that *all* potential consumers are satisfied. Potential consumers who would like a beer but can't afford 40 cents or think 40 cents does not represent good value for their money, remain 'beerless'.

Reflect on what would cause a return to equilibrium if price were temporarily 30 cents per glass or 50 cents per glass.

This is explained by Begg et al. (2000) on p. 32 using their Figure 3-3.

If you know the algebraic formulae for demand and supply schedules, it is possible to determine equilibrium prices and quantities simply by solving the two equations simultaneously.

Consider the following example. Assume the market-demand curve for avocados in, for example, Victoria is:

$$P = 240 - 3Q \qquad (1)$$

and assume the market-supply curve for them is:

$$P = 5Q \qquad (2)$$

where P = price per kg (in cents)
Q = quantity demanded or supplied per year (in tonnes)

All other variables are held constant.

We find the equilibrium quantity by solving these two equations. Substituting (l) into (2) we get:

$$240 - 3Q = 5Q$$

$$\text{or } 240 = 8Q$$

$$\text{or } Q = 30 \text{ (tonnes per year)}$$

Substituting into (1) we get:

$$P = 240 - 3 \text{ x } (30)$$

$$P = 240 - 90 = 150$$

$$\text{so } P = \$1.50 \text{ per kg}$$

Question 2.3

Assume the market-demand curve for honey per month in a provincial city is given by:

$$Q^d = 8000 - 1000P$$

and the market supply curve by:

$$Q^s = -4000 + 2000P$$

where Q^d and Q^s are respectively quantities demanded and supplied in kilograms per month.

Determine the equilibrium price and quantity.

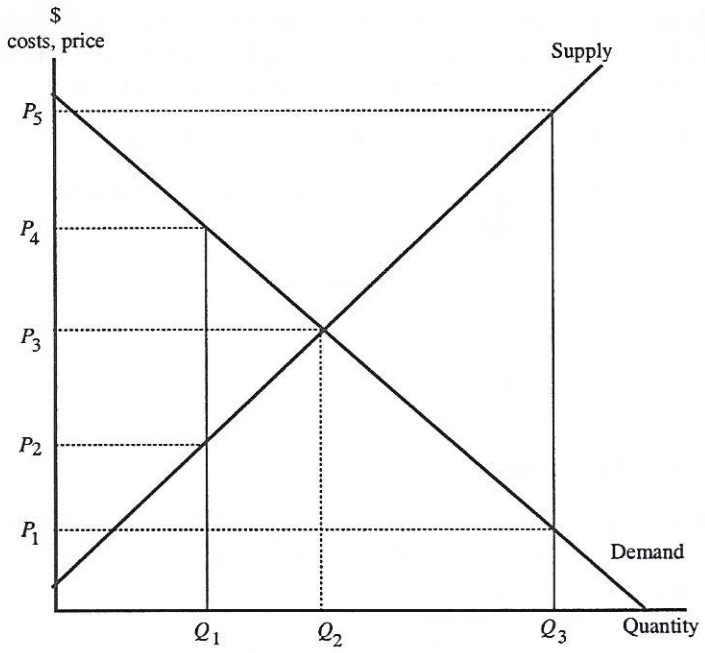
Allocative efficiency

The identification of the equilibrium price and quantity in a market is important in the study of economics for two reasons:

- The market equilibrium shows the price and quantity that an uncontrolled market will generally move towards.
- In a competitive market the equilibrium position is consistent with the most *allocatively efficient* level of production from the perspective of society as a whole, provided the demand curve provides a true reflection of the value society places on the good and the supply curve reflects all the costs associated with the production process.

It is *allocatively efficient* in the sense that at the equilibrium point, the value the last consumer places on the last unit of the good produced is just equal to the price the last supplier needs to justify production of that unit. This condition is only met at the equilibrium point.

Figure 2.5: **Allocative efficiency at the market level**



Consider Figure 2.5. If output is restricted to Q_1, the value placed on the last unit consumed is P_4 (the height of the demand curve) while the price the producers are willing to take for an extra unit of production is P_2 (the height of the supply curve). If producers are willing to accept a lower price to produce an additional unit of output than consumers are willing to pay for that unit, society as whole gains from an additional unit of production. Therefore, failure to expand production from Q_1 to Q_2 represents a lost opportunity for society because too few resources are *allocated* to the production of this good.

Now consider the case if production is expanded from Q_2 to Q_3. At Q_3 the price consumers are willing and able to offer for a unit of output (P_1) is less than the return producers need to cover the costs involved and make production worthwhile (P_5). This means society loses if this extra production takes place. There is an inefficiency created when production exceeds Q_2 because there are too many resources *allocated* to the production process.

The equilibrium quantity, Q_2, is the one level of output that is allocatively efficient from the perspective of society. The only time a competitive market will not result in an allocatively efficient outcome is when the demand curve does not reflect the true value to society of the consumption of the good and/or the supply decision of the producers does not take full account of the costs of all the resources used in the production process. These problems are referred to as *market failures* and they are the focus of attention in Topic 10. At this stage it is also relevant to note that the level of output that is allocatively efficient from the perspective of society is not necessarily allocatively efficient as far as an individual firm is concerned. Efficiency from the perspective of a firm will be addressed in Topic 7.

Demand, supply and equilibrium

The simple supply and demand framework we have developed can be used to analyse changes in equilibrium situations. It is, for example, of value in explaining the likely impact on equilibrium prices and quantities of:

- changes in demand or supply or both due to market forces;
- particular government policy decisions that interfere with market forces in achieving equilibrium.

We discuss these issues under two sub-headings:

- changes to equilibrium, and
- interferences with equilibrium.

Changes to equilibrium

These will occur as a result of shifts in market demand or supply curves or both. We have noted already that shifts in market-demand curves will be caused by changes in variables such as:

- prices of alternative consumption commodities;
- income; or
- tastes.

Shifts in market supply curves will be caused by changes in variables such as:

- prices of alternative production commodities;
- prices of factors of production;
- goals of firms; or
- the state of technology.

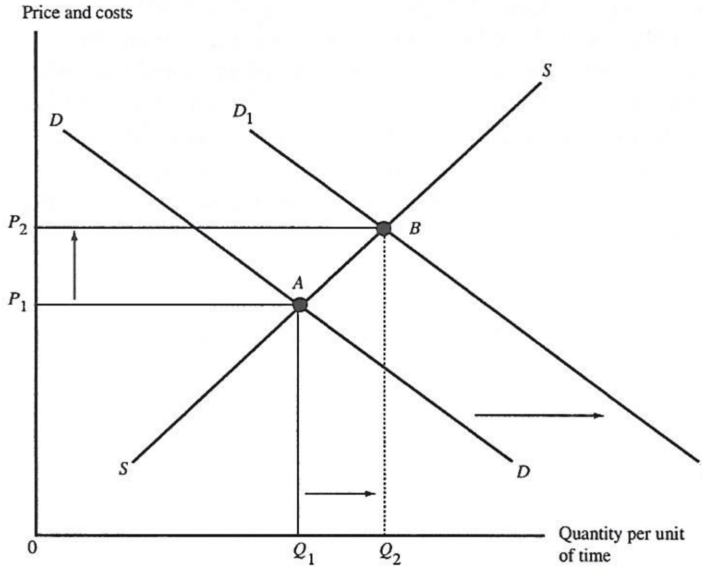
We have examined these variables in detail.

Let us consider four examples:

Example 1

Suppose that an increase in *consumer income* occurs. This will cause the market demand curve to shift to the right as in Figure 2.6 from DD to D_1D_1. If the supply curve does not move, equilibrium prices will increase eventually from P_1 to P_2 while equilibrium quantity will increase from Q_1 to Q_2.

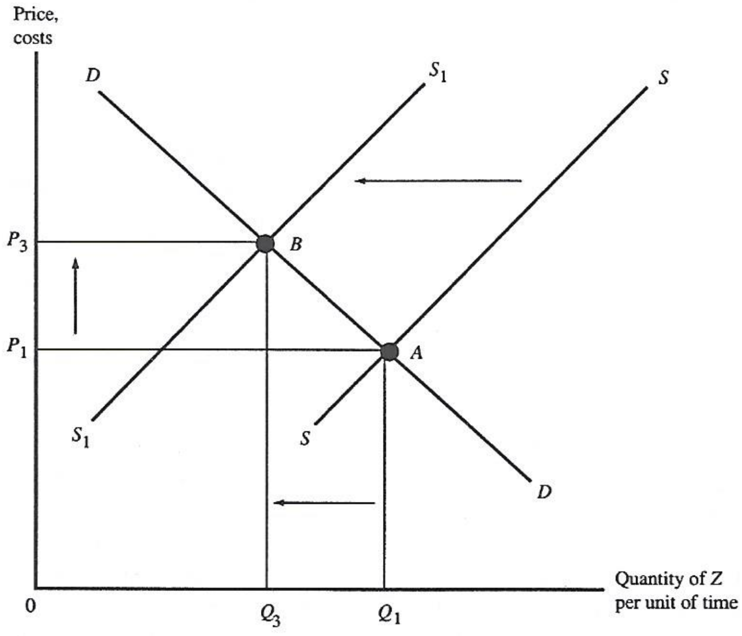
Figure 2.6: The effect on equilibrium price and quantity of increased income



Example 2

Suppose there is an increase in the overall level of wages for workers in the industry which produces *Z*. This will cause the supply curve to shift to the left from its original *SS* to S_1 S_1 in Figure 2.7. If the demand curve does not move, equilibrium prices will increase eventually from P_1 to P_3, and equilibrium quantity will decrease from Q_1 to Q_3.

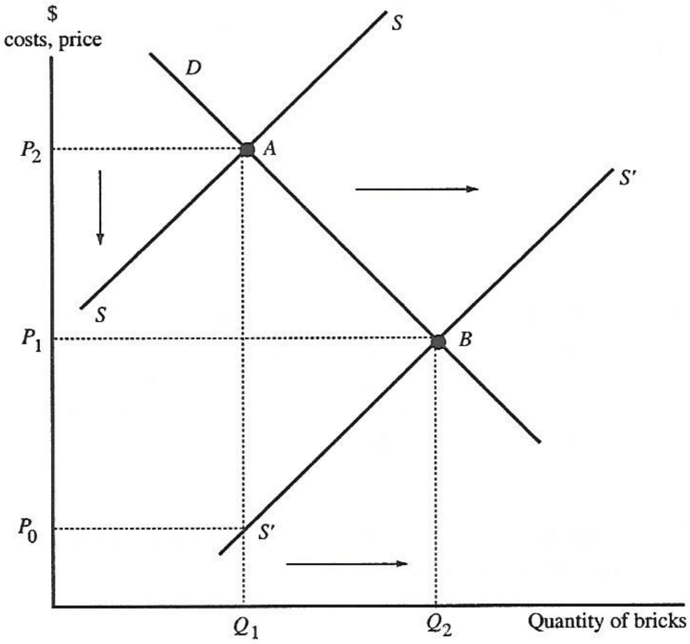
Figure 2.7: The effect on equilibrium price and quantity of increased income to workers



Example 3

Suppose there is an improvement in *technology* used in the production of bricks. This case is portrayed in Figure 2.8. The improvement in technology will effectively reduce production costs and increase the profitability of producing bricks. This improvement in profitability will shift the supply curve out to the right from *SS* to *S'S'*. The end result is a reduction in the price of bricks (from P_2 to P_1) and an expansion in the quantity consumed in equilibrium (from Q_1 to Q_2). (Note our notation—P_0, P_1, P_2, etc.—is based on ascending numerical value order, not time order.)

Figure 2.8: Impact of a change in technology



The reduction in costs associated with this technological change is given by the vertical distance between the two supply curves, i.e. $P_2 - P_0$. The intuitive explanation for this interpretation is that prior to the technological change the producers were willing to supply Q_1 bricks for P_2. After the technological change they are willing to supply the same quantity for only P_0. Given we have changed nothing apart from the technology, it follows that the effective reduction in costs must be $P_2 - P_0$.

Note that part of the reduction in costs has been passed on to consumers (or people further up the marketing chain) in the form of lower prices. $P_2 - P_1$ has been passed on to consumers leaving $P_1 - P_0$ as the residual per unit gain to producers from the introduction of the new technology. The steeper the demand curve the greater will be the gain to consumers and the less will be the gain to producers. If the demand curve was a vertical line (consumers are completely unresponsive to price changes over the range of prices considered) all the gains from new technology flow to consumers and none to producers. In this polar case the profit position of producers would be unchanged. Prices would fall by the extent of the cost reductions.

Even in this extreme case producers will probably adopt new technology. But why should they act in this way if there are no profits to be earned after adoption of the technology? The answer is that there are still profits to be gained in this case if you are amongst the first to adopt the technology. If you only produce a small share of the total industry's output, your adoption of the technology and expansion in production will have no measurable impact on the price you receive. You will have lower costs and the same price so your profits will increase. This will be the case until the adoption of technology and expansion in output by other firms reduces the industry price. However, you will continue to earn some extra profits until the last firm adopts the technology and the supply curve has completed its shift.

Now consider the case of the laggard or late adopter. They may be reluctant to embrace the technology but the adoption by other producers will depress market prices. As they have not adopted the technology (and hence benefited from the lower costs), their profits will be squeezed. Eventually downward pressure on profits will force them to adopt the technology just to sustain their original profit levels.

The adoption of technology tends to be a continual process with firms constantly searching for new ideas and then doing all they can to protect those ideas from the competition. This competition on the basis of cost is an important element in many markets and we will consider it in more detail in Topic 7.

Example 4

Suppose there is a change in *consumer preferences* towards a particular brand of soft drink. The effect of successful advertising is to shift the demand curve out in the same way an expansion in consumer income would (i.e. as in Example 1). The end result would be higher prices for the product together with higher sales. Whether this has improved the profit position of the firm or not depends on the level of resources that were devoted to the campaign. Not all advertising pays—some costs too much and some has no impact.

It is common for larger firms to spend millions of dollars a year trying to shift their demand curve out—its called promotion and more often than not takes the form of advertising. In many industries the firms operate independently of each other and compete heavily through advertising. In industries characterised by many small producers such as the Australian agricultural industries, the producers may ban together and pool their resources to undertake major advertising campaigns in Australia and overseas. For example, most readers will be aware of the 'Woolmark' campaign. If you are not, it may suggest that the many millions of dollars that were devoted to this promotional activity did not have the impact it might have had. The ultimate test of the impact of a promotional strategy is how much it adds to profits, and it can't add to profits if the strategy does not change consumer tastes and preferences in favour of your product or service.

Question 2.4

Assuming that tea is regarded as a substitute for coffee, how will the failure of a coffee crop affect the market for tea? Illustrate graphically, and briefly explain. (Hint: Start by sketching demand and supply schedules for both coffee and tea—one sketch for coffee, one for tea.)

(Confine your explanation to about one page.)

Question 2.5

The demand for commodity X increases. There is also an increase in supply. What will be the resultant impact on price and quantity demanded of commodity X?

(Answer in a few words, with possibly a sketch or two.)

Question 2.6

Assess the likely impacts of changes in the following variables on equilibrium prices and quantities in each of the following cases:

(a) an increase in the price of substitute commodities;

(b) a new breakthrough in production technology; and

(c) a change in tastes away from the commodity in question.

Can you identify examples of each of these three occurrences from your work experience? Have the effects on price and the quantity produced been in line with those suggested by our simple analysis?

Do not be too concerned if they are not, because there are complicating factors which we have not yet considered. Some of these complications will be introduced in later topics.

Let's now consider the second area where equilibrium situations can be changed.

Interferences with equilibrium

Two of the major forms of market intervention taken by governments are the setting of

- price floors, and
- price ceilings.

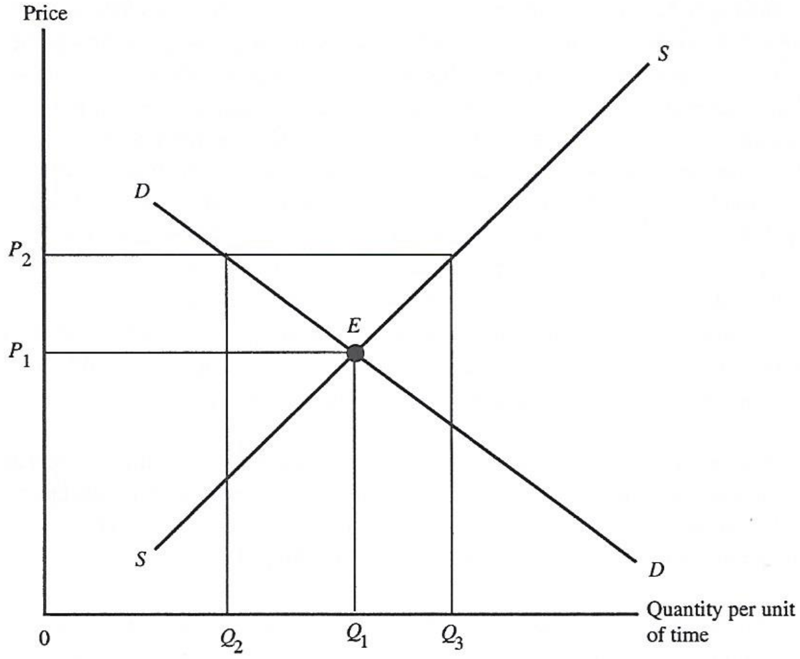
There are also other types of intervention such as commodity taxes which are likely to push equilibrium prices up. We will confine our attention to price floors and ceilings.

Price floors

> Price floors cause market distortions when they are set *above* the equilibrium price that would otherwise occur.

For instance, in Figure 2.9, normal equilibrium price and quantity will be P_1 and Q_1 respectively. But a minimum price has been set at P_2. Here the quantity that producers will supply is Q_3, and this exceeds the quantity demanded, Q_2. There will clearly be a surplus of the commodity produced.

Figure 2.9: The effects of a price floor



Application of price floors—The reserve price scheme for wool

Between 1971 and 1991, the Australian Wool Corporation (AWC) administered a floor price scheme at auctions of raw wool in Australia. The floor prices were generally set by the federal minister responsible for agricultural matters. The floor was maintained through a stockholding scheme. When auction prices were likely to fall below the floor the AWC would enter the auction biding and by wool. This meant that in periods of depressed demand the AWC would buy in wool and build up stocks of wool. When prices recovered , with growth in demand or reductions in production, the AWC would dispose of their stocks of wool. The scheme was funded by a compulsory levy on all raw wool sold in Australia.

The Reserve Price scheme worked well for most of its 20 year existence in that it tended to reduce the severity of fluctuations in wool prices. In running the scheme the AWC had a firm policy that the reserve or floor price would never be lowered. they claimed that this policy was important in maintaining wool processors confidence in the scheme. The success of the operation of the scheme rested on two points:

- that Australia produced most of the world's supply of wool suitable for use in the apparel trade and so manipulating Australian supply influenced world prices; and
- the parties that were responsible for setting the floor price were able to forecast future wool prices with enough accuracy to ensure that the floor price that was set was in fact sustainable.

In 1987 the wool market went into one of its boom periods. Wool prices rose by more than 60% in one year and almost doubled over a two year period. At around about this same time the responsibility for setting the floor price shifted from the responsible federal government minister to the AWC itself. Confronted with this strong market the AWC made a fatal mistake. In forecasting future wool prices they came to the conclusion that this price rise was sustainable in the long run so they moved the floor price up dramatically- more than doubling its previous level.

Unfortunately for the AWC, Australian wool growers and Australia as a whole, in the period following the hike in the floor price the demand for wool dropped off dramatically due to the economic collapse in Russia (the major customer) and the downturn in economic activity in the other main wool consuming countries of the world. The result was that the equilibrium price was substantially below the new floor price and there was no real prospect of demand recovering in the short to medium term. Wool buyers left the market at nearly all wool produced in Australia went into the AWC's stocks. In buying this wool at auction the AWC exhausted its financial reserves and was forced to borrow more than $2 billion to fund the scheme. In mid-1991 the AWC had a stockpile of 4.5 million bales of wool or more than one years total Australian wool production and a debt of $2.7 billion. At the same time the floor price guaranteed wool producers continued high prices for their output so production continued at high rates even though there were no buyers for the product other than the growers own body. The AWC was still standing firm on its commitment to not reduce the floor price.

At this stage the federal minister stepped in and disbanded the scheme. A separate government body was set up with the responsibility of disposing of the stockpile and wool growers had a special tax imposed upon them to meet the AWC's obligations with respect to the debt incurred in building up the stockpile.

Similar stories have occurred with all previous attempts to set floor prices for commodities e.g. tin and rubber. This piece of recent history highlights the importance of understanding the factors driving demand and the potential dangers that come with trying to distort those basic market realities.

Price ceilings

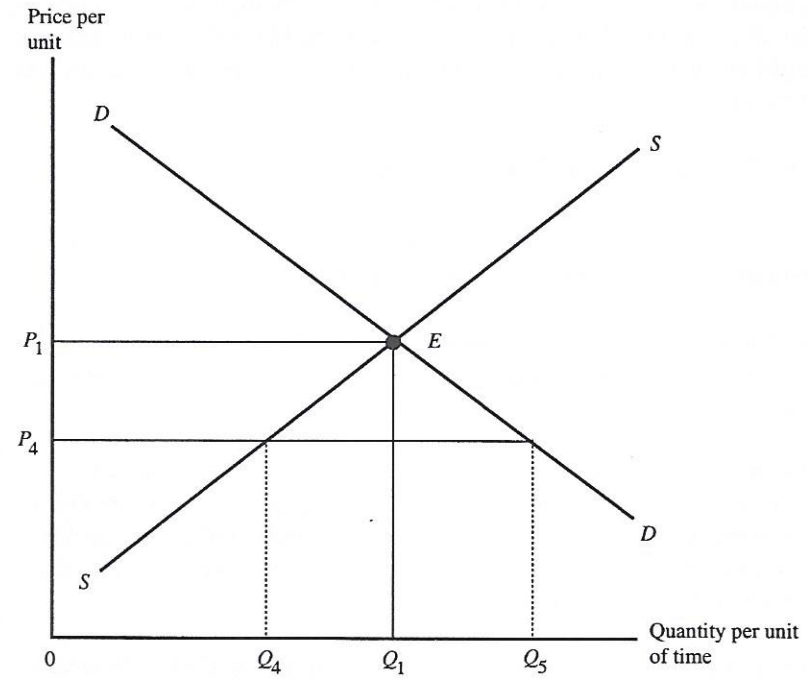
> Price ceilings cause market distortions when they are set below the equilibrium price that would otherwise occur.

For instance, in Figure 2.10, normal equilibrium prices and quantities will be P_1 and Q_1 respectively. But suppose a maximum price has been set at P_4. Here the quantity that will be supplied is Q_4 and the quantity demanded is Q_5. There is clearly a shortage of the commodity.

There are also several interesting examples of price ceilings. Consider the following two cases:

- During World War II there were price controls in many countries, and a consequence of this was that rationing had to be adopted. This often led to a black market.
- During the post-war period prior to 1960, Australian banks were obliged to maintain very low interest rates on loans to clients, but only limited funds were made available to meet the ensuing demand. To meet the shortage of finance, several new non-bank financial intermediaries were developed to provide money at higher interest rates. Because of their constitutions these were not subject to central bank control.

Figure 2.10: The effects of a price ceiling



Again from your own experience you may be able to list some other examples of price ceilings. Do not, however, be worried if you cannot immediately think of any.

The case of rent ceilings is explored by Begg et al. (2000, p. 38). When reading their analysis of ceilings, you should pay particular attention to the implications of the slope of the supply curve. The slopes of the curves are critical in understanding the likely impact of all sorts of government controls as well as the impact of shifts in the curves.

The slopes of the curves indicate the responsiveness of supply or demand to price changes. In the next topic we examine this issue of demand and supply response in some detail using the concept of an elasticity.

☐ *At this point, read sections 3-8 and 3-9 in Begg et al. (2000), pp. 37–42, to review the material presented so far. (Note that the text analyses minimum wage legislation as a form of price floor.)*

Question 2.7

Suppose the government decided that meat was a basic staple of life in Australia and that meat prices were too high for lower income earners. To make meat more affordable the government passes a law which says that no meat shall be sold for more than $2.50 per kilogram.

(a) What market impact would you expect to see flowing from this regulation?

(b) What factors would determine the magnitude of this impact?

(c) List some policy measures, other than a price ceiling, that could be used by the government to achieve the same objective of making meat available to low income earners.

☐ *Readings 2.1 should be read now. The paper demonstrates the application of the basic principles covered in this topic. In this case the application is the explanation of attendances at football games. You should attempt to classify the variables identified by the authors under the broad categories identified in this topic, e.g. price, income, and tastes and preferences.*

Finally, an application close to the heart!

Demand and supply conditions for economists

The forces of demand and supply exert a powerful influence on the market for goods and services, and in the markets for labour and other inputs. An interesting case in point is the economics industry itself.

The demand for economists originates in the private sector, where they are employed in business—usually in staff rather than line positions—as consultants and commentators; in government, where economic analysis often guides public policy; and in academia, where economists are employed in teaching capacities, primarily at the college and university levels.

During recent years, financial economists have made quite a splash on Wall Street, offering their services in the pricing and marketing of complex financial instruments. Although perhaps no more than 500 to 1,000 economists are actually employed in this capacity, the rapid growth of the industry, and bonus-based compensation plans that run into the several hundred thousand dollars per year for a handful of stars, has made this business highly visible. Many more economists, perhaps a few thousand, are employed in industry for their forecasting input concerning trends in macroeconomic conditions, as well as for their microeconomic advice concerning pricing, output, and other decisions. The National Association of Business Economists, for example, counts roughly 3,000 members in a wide variety of industries. However, employment in this sector of the industry can be quite cyclical. During the recession of 1991, for example, several brokerages, banks, and other financial institutions trimmed their economics staff considerably. Consulting and speech making, while a fairly small segment, is the glamour end of the business. Stars such as Lester Thurow, Dean of the Sloan School of Management at the Massachusetts Institute of Technology, have the capacity to earn hundreds of thousands of dollars per year in fees for consulting, speaking engagements, and publishing. The earnings of celebrity economists such as Milton Friedman, John Kenneth Galbraith, Robert Heilbroner, Arthur Laffer, Paul Samuelson and Lester Thurow are high in large part because they are so rare. The supply of such 'superstars' is severely limited.

In terms of sheer numbers of jobs, perhaps the best employment opportunities for economists are in academia, especially for those who hold the doctoral degree. According to *Job Openings for Economists*, a publication of the American Economists Association, roughly 80 to 90 per cent of the total number of job opportunities on economics are in four-year colleges and universities. An overwhelming majority of the roughly 20,000 members of the AEA hold academic jobs.

Since the mid-1970s, the number of new Ph.D.s in economics has held steady at roughly 750 to 800 per year. This means that the supply of new academic economists is quite high when compared to the number of new Ph.D.s in related disciplines like accounting, finance, management and marketing. In fact, each year the number of new Ph.D.s in economics in roughly equivalent to the number of Ph.D.s granted in all of the functional areas of business administration combined.

Thus, academic job market candidates from leading programs in economics may count themselves lucky to receive two or three attractive job offers after graduation, whereas similar candidates from leading business programs often enjoy two or three times as many job opportunities and typically at substantially greater salaries.

New Ph.D.s in accounting, for example, total no more than 100 to 150 per year. At that pace, it will take 20 years to fill current vacancies in accounting. Therefore, it is perhaps not surprising that salaries for new academic Ph.D.s in economics are in the $40,000 per year range, but they are in excess of $60,000 per year in accounting. What is surprising is how slowly the supply of accounting Ph.D.s from high-quality doctoral programs has grown during recent years. Apparently, employment opportunities in the private sector are so attractive that talented accounting undergraduates do not find the Ph.D. sufficiently rewarding to encourage them to pursue advanced degrees. Although this might explain the failure of accounting students to pursue advanced degrees, why don't economics Ph.D. students switch to accounting?

Source: Hirschey & Pappas (1996), p. 148.

Summary

The basic concepts of supply and demand have been analysed in this topic. The determinants of demand and supply have been identified and the concept of an equilibrium has been developed. We have analysed the implications of shifts in supply and demand curves for equilibrium price and quantity levels.

Supply and demand curves were used as basic analytical models to examine the impact of a range of factors, including government regulations concerning price ceilings and floors and changes in the technology used in an industry.

In the next topic we extend our analysis of supply and demand to look at how this framework can be used in a strategic sense in firm level decision making. The concept of an elasticity is introduced as an analytical devise to facilitate the use of supply and demand concepts in strategy formulation.

Review questions

Review question 2.1

Outline some ways in which a change in the demand or supply conditions in a market for a particular good may affect conditions in another market (i.e. for another good).

Review question 2.2

Between 1981 and 1987 the US government expenditure on drug enforcement more than tripled—from less than US$1 billion per year to about US$3 billion. By arresting drug users and emphasising the hazards of drug use, these programs have attempted to push the demand curve for drugs to the left. By trying to seize drugs entering the country

and by trying to make it more costly for drug smugglers and producers to avoid arrest, they have attempted to push the supply curve to the left.

(a) Between 1981 and 1989 the price of cocaine fell from US$115 to US$88 per gram. Does this mean that the programs are failing?

(b) Between 1981 and 1989, the amount of cocaine seized by the government increased from 1.7 tons to 85 tons. Does this mean the programs are working?

(c) According to a study carried out by the RAND Corporation, it is relatively inexpensive for people to produce and smuggle cocaine into the US and government attempts to keep it out seem to result in only minor increases in these peoples costs. Does this suggest that the programs are likely to shift the supply curve for cocaine to the left?

(d) The RAND study suggests that the supply curve for cocaine has shifted to the right because smugglers have become more adept at their trade. Would this help to explain the fall in the price of cocaine? If true, what does it indicate about the success of existing government programs?

Source: Mansfield (1994), pp. 57–8.

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Heath, Massachusetts.

Further reading

The material listed below extends and provides alternative perspectives on the issues discussed and they are referred to as further reading for most topics. The books by Baumol et al. (1992) and McTaggart et al. (1996) are general economics texts while Mansfield (1994) and Petersen and Lewis (1994) provide more applied perspectives on the issues with a greater emphasis on case studies.

Baumol, W.J., Blinder, A.S. & Hicks. J.R.L. 1992
Economics: Principles and Policy
2nd Aust. edn, Harcourt Brace Jovanovich, Sydney, Chapter 2.

Mansfield, E. 1994
Applied Microeconomics
Norton, New York, chapters 2 and 5.

McTaggart, D., Findlay, C. & Parkin, M. 1996
Economics
2nd edn, Addison-Wesley, Sydney, chapters 4 and 6.

Petersen, H.C. & Lewis, W.C. 1994
Managerial Economics
3rd edn, Macmillan, New York, Chapter 3, pp. 70–5.

Suggested answers

Topic 2

In-text questions

Question 2.1

Billabong Boomerangs Inc. and Swahili Spears

(a) 116,214.5.

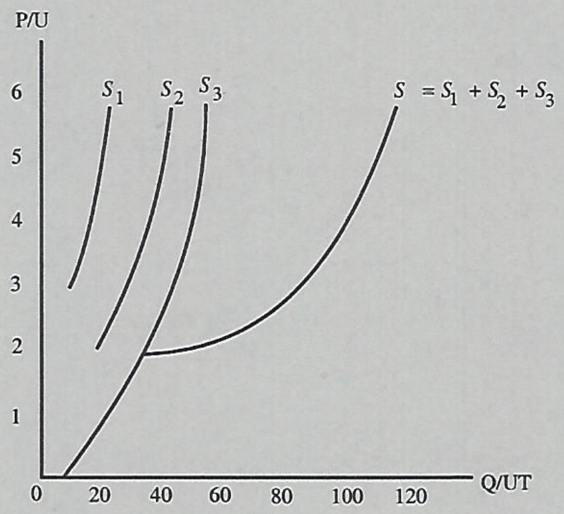
(b) 354,214.5 or 238,000 higher (350 × 680).

(c) In assessing whether it is desirable to double advertising expenditure the firm should consider the follow factors:

- the impact of the increase in expenditure on the level of sales (in both the short and long run);
- the level of additional expenditure planned;
- the impact the advertising has on price; and,
- the possible response from the competitors.

Question 2.2

Supply curves for commodity X



Question 2.3

Equilibrium price and quantity.

In equilibrium we know that $Q^d = Q^s$.

Hence $8000 - 1000P = -4000 + 2000P$ or $12000 = 3000P$.

Therefore, $P = 4$.

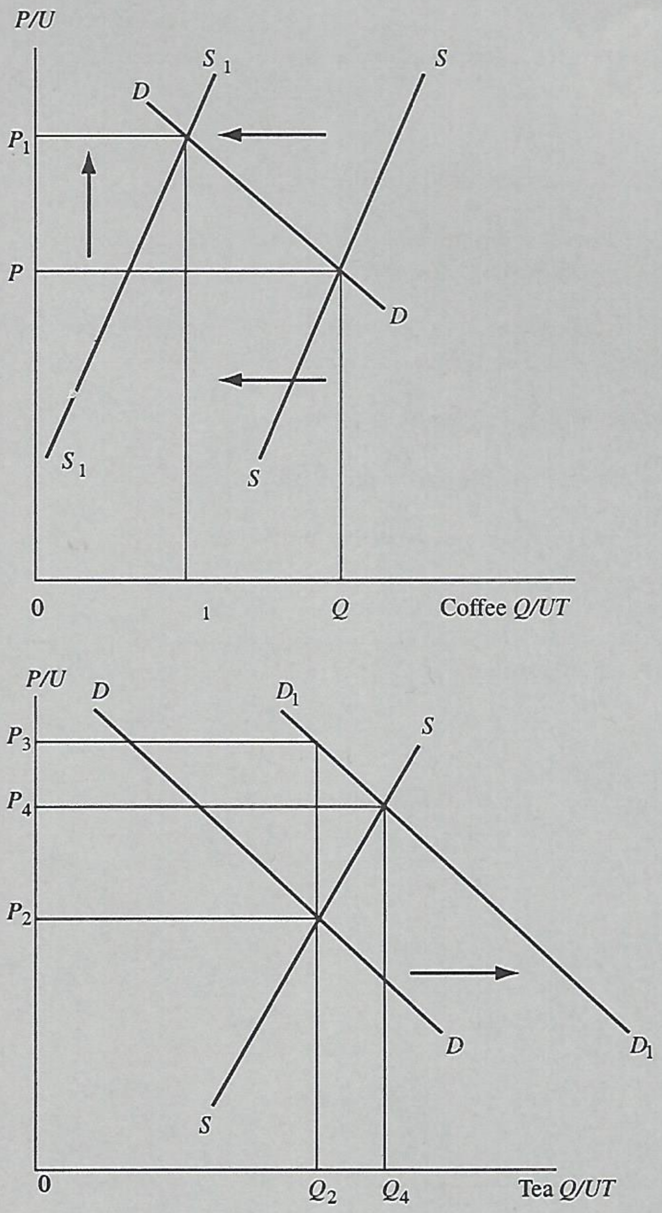
Substituting back into the market-demand function,

$$Q = 8000 - 1000 \times 4.$$

Therefore, $Q = 4000$.

Question 2.4

The effect of coffee-crop failure on the market for tea

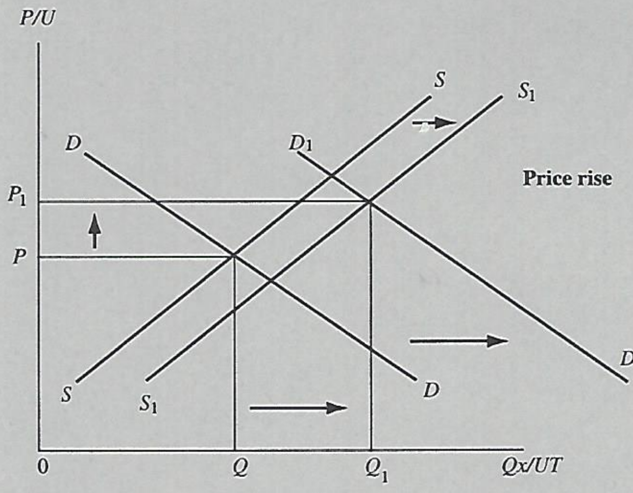


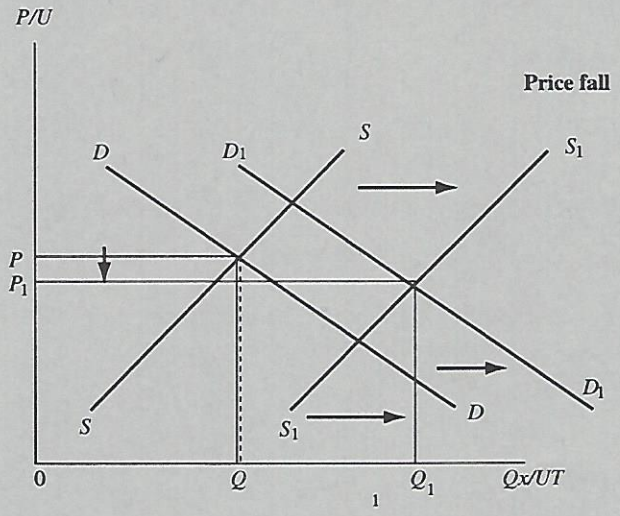
- Failure of the coffee crop means a fall in supply, i.e. the supply schedule moves to S_1S_1. Quantity of coffee available is reduced with consequent rise in the price of coffee from P to P_1.
- If the coffee crop failed completely, then there would be no supply schedule.
- Given that tea and coffee are substitute commodities, the increased price for coffee causes an increase in demand for tea, i.e. the demand schedule moves to D_1D_1.
- Thus a new tea equilibrium is found, P_4Q_4.
- Tea producers may be able to supply the increased quantity, OQ_2 to OQ_4, from stocks held, in which case price will move toward P_4.
- If, however, the increased quantity can not be supplied from stocks held, then price will rise toward P_3 because tea growers (in common with agricultural producers generally) are unable to increase supply at short notice. They may be able to increase the supply of tea at the next harvest, by which time the situation with respect to coffee will probably have changed.

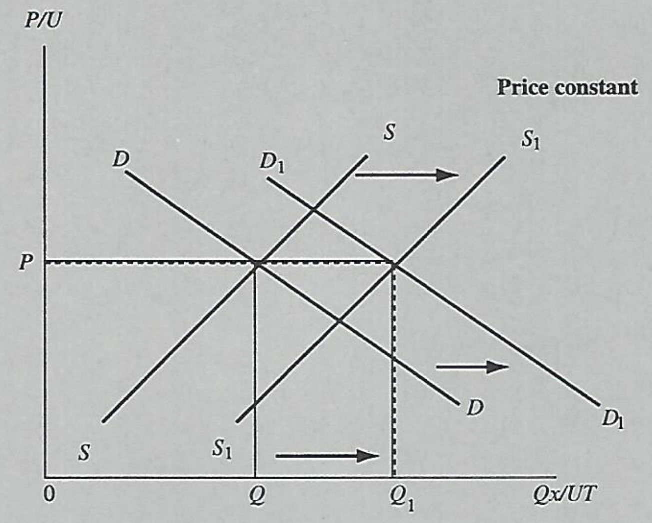
Question 2.5

Increases in demand and supply

The quantity of *X* supplied will increase. With the information given it is not possible to predict the impact on price of *X*: price may rise, fall or stay the same. This conclusion is explained by the following three diagrams.





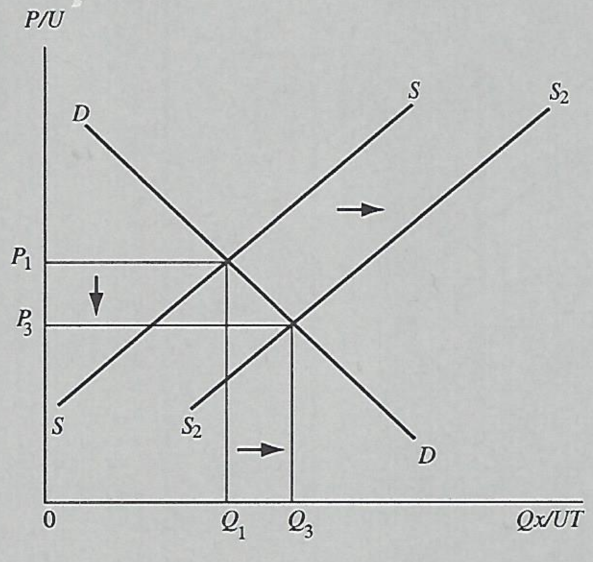


Question 2.6

The impact of changes on equilibrium prices and quantities

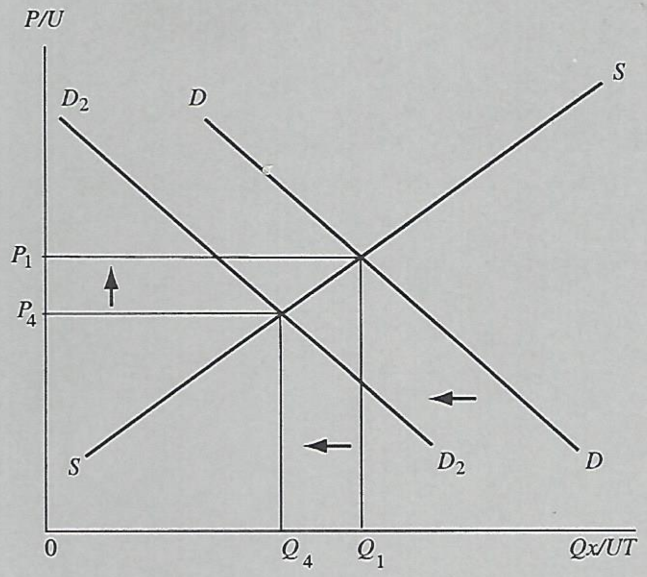
(a) An increase in the price of substitute commodities will shift the demand curve for a commodity to the right, i.e. cause an increase in demand. There may, however, be a compensating movement to the left in the supply curve. Because of this double movement it is not possible to forecast clearly the actual impact on prices and quantities produced and consumed in equilibrium.

(b) A new breakthrough in production technology will push the supply curve to the right, i.e. supply will increase, e.g. from *SS* to S_2S_2 in the following figure.



Equilibrium price will fall from P_1 to P_3 and equilibrium quantity will rise from Q_1 to Q_3.

(c) A change in taste away from the commodity in question will move the demand curve to the left, i.e. demand will decrease, e.g. from *DD* to D_2D_2 in the figure below.



Equilibrium price will fall from P_1 to P_4, and equilibrium quantity from Q_1 to Q_4.

Question 2.7

(a) The impact of the price ceiling would be to reduce the supply of meat onto the legitimate domestic market. More supply would go overseas, some meat producers will shift into other industries and a black market may develop.

(b The extent of the changes one would expect are likely to be determined by the magnitude of the gap between the ceiling and the free market equilibrium and the slopes of the supply and demand curves for meat.

(c) The point to note here is that there is usually a number of different policies that can be used to achieve a government objective and they all have different consequences. Alternative policies include price subsidies to consumers, production subsidies for meat producers, general income supplements for low income earners and general macro policies that encourage income growth for wage earners.

Review questions

Review question 2.1

Markets are linked through prices. Changes in the supply and demand curves in market A will change the price of good A. This price change will have an impact on market B if good A is related in consumption to good B. Goods A and B could be complements or substitutes.

Review question 2.2

(a) Not necessarily. If the leftward shift in the demand curve were greater than the leftward shift in the supply curve, both price and the quantity of cocaine consumed would decrease.

(b) Not necessarily. An increase in the amount seized does not imply that less was entering the US.

(c) No, it suggests that the programs are likely to have little effect on the supply curve.

(d) A rightward shift in the supply curve would help to explain the fall in the price. If true, it would indicate that government programs are not making great progress, since one of the principal aims is to shift this supply curve to the left.

Source: Mansfield (1994), pp. A13–14.

Attendance patterns at Victorian and South Australian football games

Reading 2.1

Peter Fuller & Mark Stewart

1. Introduction

The Coodabeen Champions once suggested that if the Australian Football League (AFL) was to begin making apologies for their mistakes, it should also come clean and apologise for the greenhouse effect, child poverty and third world debt. This reflects a belief widely held by many football enthusiasts that the AFL is conspiring against the best interests of the game.

However, the statistical analysis in this paper suggests that in the matter of spectator appeal, the AFL's policies have played a part in reversing a long term downward trend in attendance in Victoria. In South Australia, the admission of the Adelaide Football Club (AFC) to the national competition in 1991 has seen an increase in the number of people attending football in that State.

We recognise there may be many other criteria by which the success or otherwise of football administrators might be judged. Many of these factors do not lend themselves to easy quantification. Therefore this paper confines itself to the objective measure of spectator numbers. A simple econometric model is used to quantify the determinants of attendance at football matches.

Earlier studies have established the key factors affecting attendance for a variety of spectator sports in Britain and the United States. These include the

- real price of admission (nominal price corrected for inflation),
- real income of possible attendees (nominal income corrected for inflation),
- potential supporter base (population of the relevant geographic area),
- uncertainty of outcome of the contest,

- significance of a particular game (team quality, style of play, star players etc..)
- stadium size,
- safety of spectators, and
- television coverage.

Borland and Lye (1991) studied attendance at Australian football. They considered attendance for each VFL match 1981/86. They identified variables specific to individual games, as well as season-specific factors that influenced attendance. Real price, real income, television and unemployment were the season-specific variables tested, while the match-specific factors included ground capacity, the weather, uncertainty of outcome, prior success of the competing teams, lagged attendance (as a measure of habit) and the effect of split rounds.

Borland (1987) considered season aggregate VFL attendances 1950/86. He looked at a number of variables, including the real price, real income, television and uncertainty of outcome.

This paper also examines season attendance, but it extends the time frame to 1948/94. The South Australian experience during a similar period has also been considered.

II. Scope of this study

In this analysis the focus is on attendance at minor round AFL/VFL football games played in Victoria (Melbourne and Geelong) and minor round South Australian National Football League (SANFL) and Adelaide Football Club (AFC) games played in South Australia (Adelaide). Attendance at finals and games played outside Victoria and South Australia have been excluded.

In any product analysis it is necessary to define the market. In this paper we are looking at the markets for football spectators in Victoria and South Australia.

The Victorian attendance figures were derived by excluding home game attendances for Sydney (1982 on), Perth and Brisbane (1987 on) and Adelaide (1991 on) from VFL/AFL figures.

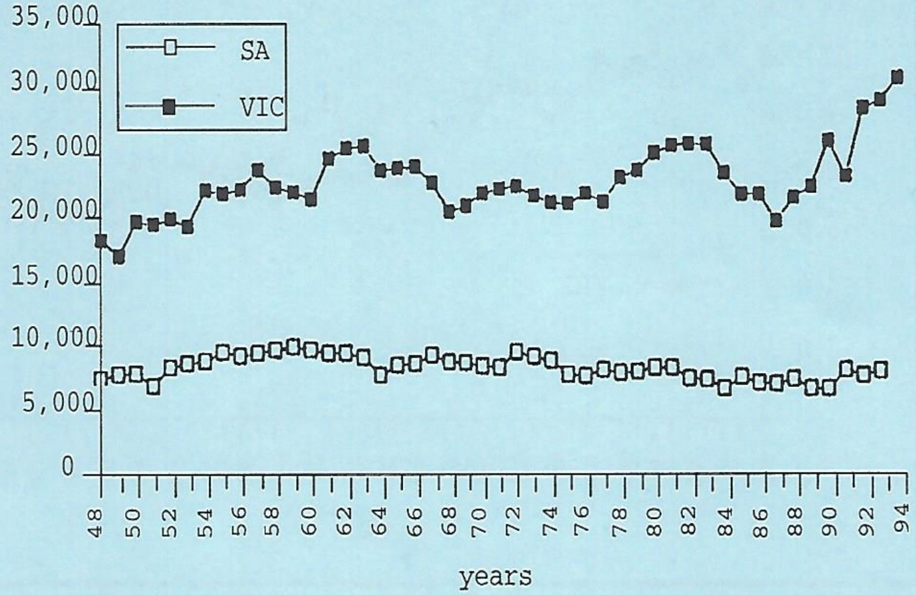
The South Australian attendance figures were obtained by adding AFC home game attendances to SANFL minor round attendances from 1991/93. Prior to 1991 the data obviously refers to the SANFL only.

The analysis was confined to minor round matches because additional/ different factors are likely to affect finals attendances (for example varied admission prices, ground capacity and the support base of the teams involved).

Chart 1 shows average attendance per minor round game in both States.

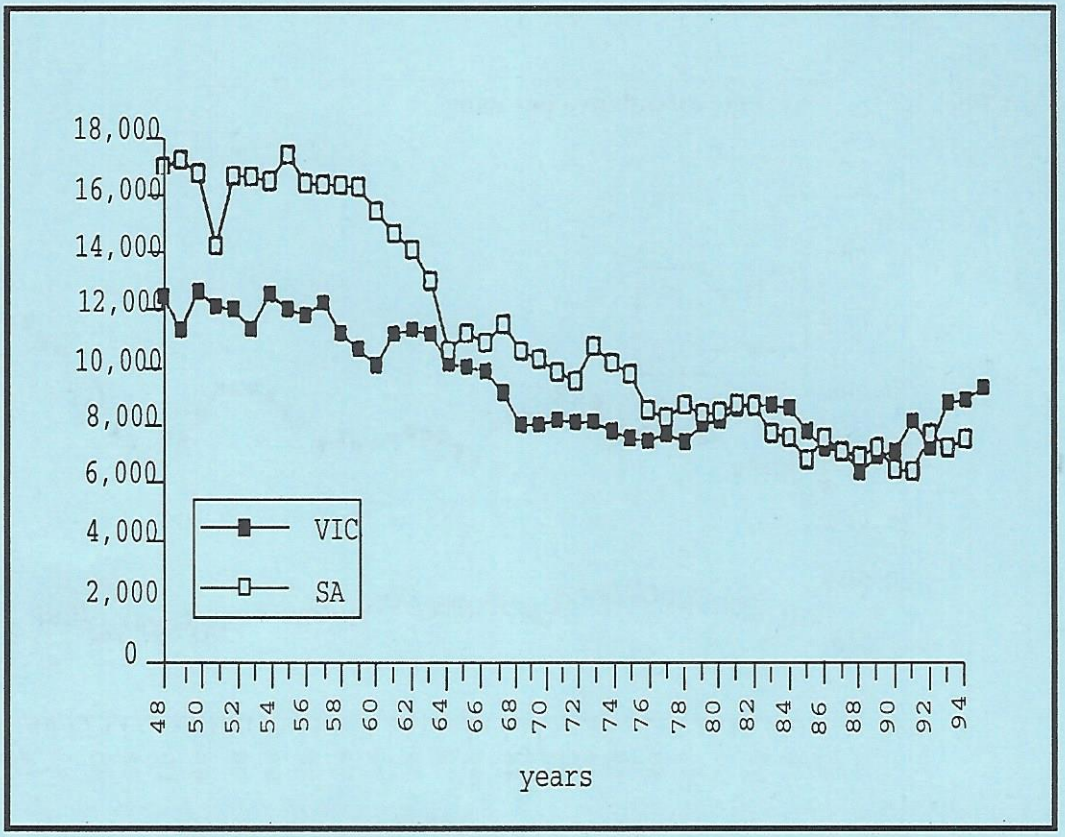
As Melbourne's population is approximately three times that of Adelaide it is not surprising average attendance per game is substantially higher in Victoria than in South Australia. A more appropriate comparison can be made by considering attendance on a per capita basis. That is, proportionate to the populations of the cities where games are played. Chart 2 illustrates this.

Chart 1: Average attendance per game



This chart shows that for most of the post-war period South Australian attendance (on a per capita basis) was higher than that for Victoria. In both States (until recently) attendance was in decline, indicating football was becoming proportionately a less popular form of entertainment. The popularity of football in Victoria reached its nadir in 1987. In each subsequent year attendance has risen, with the exception of 1991. In South Australia, football's popularity reached its lowest point the year before the introduction of the AFC in 1990.

Chart 2: Attendance per game per million people



III. Factors influencing football attendance

In both Victoria and South Australia the reversal of these downward trends in attendance appears to coincide with significant changes in each competition. In the mid to late 1980s the AFL/VFL introduced a number of modifications. Among these were:

- the continuation of progress towards a national competition with the introduction of Perth and Brisbane (1987) and Adelaide (1991) following the relocation of South Melbourne to Sydney in 1982.
- the move towards night and Sunday games. In 1975 the 22 minor round games were played on just 23 different days, while in 1994 the equivalent number of rounds were played on 53 different days in Melbourne and/or Geelong. While this allows a football fanatic to contribute to attendance figures on a multiple basis during most weekends, its major impact is probably to permit those with other Saturday afternoon commitments to attend matches schedules at other times.
- the continuation of ground rationalisation. Richmond (1965), North Melbourne (1985) and Essendon (1992) all moved their home games to the MCG. Fitzroy (1967) and Hawthorn (1974) began playing at Princes Park, while Hawthorn (1991/92) and St Kilda (1993) moved to Waverley Park. In 1985 36% of all minor round games played in

Victoria were either at the MCG or Waverley Park (formerly VFL Park), while in 1993 this figure was 59%. These moves have generally shifted matches to grounds with greater capacity as well as providing improved spectator comfort.

- the introduction of the national player draft in 1986, the salary cap in 1984 and subsequent modifications to these arrangements, which were designed to make the AFL/VFL more competitive.
- the recent draft concessions for the perpetual poor performing clubs.

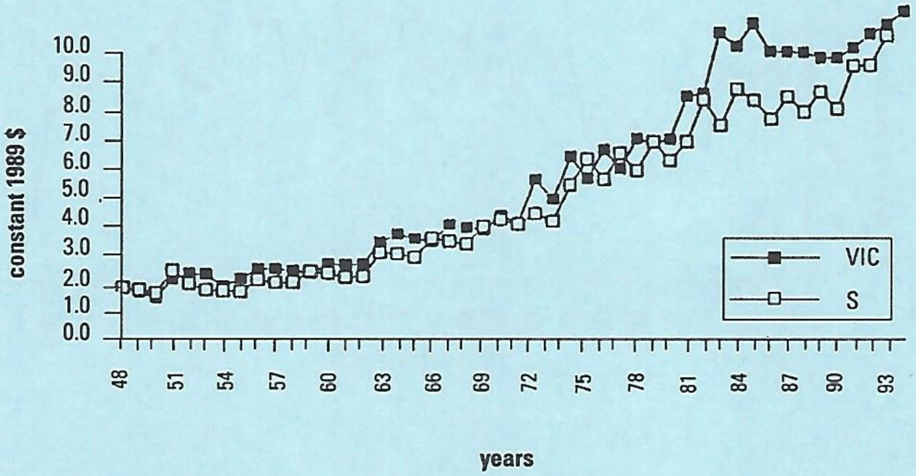
In South Australia the major change was the entry of the Adelaide team in the national competition in 1991. Prior to this attendances at football games in South Australia had been in continuous decline. One of the reasons for the falling popularity of the SANFL may have been the less than favourable comparison with the now national AFL competition. This was being highlighted by live telecasts of AFL games in direct competition with SANFL games.

To ascertain the impact of these changes in the increase in attendance in both States, the conventional determinants of sporting event popularity were systematically examined.

In seeking to explain variations in the sales of any product a key variable is price. Specifically the price of the product and the prices of close substitutes and complements (items used in conjunction with the product). As Borland and Lye indicate, the total cost of attending football should include the prices of the complementary products such as transport, parking, food, cost of reserved seating at some venues, etc. Like those researchers, however, the present inquiry could not find adequate reliable data on these factors. Also, like the earlier studies, the prices of close substitutes were not considered. Rather, we used the real price of admission (excluding inflation), as this measures the price of attending football relative to the price of all products.

Chart 3 shows the real minimum price of adult admission to the 'outer' for minor round games in both States.

Chart 3: Real price of admission



This chart indicates that the real price of attending football has generally been higher in Victoria than South Australia. The real price in Victoria rose slowly from 1962, and substantially from around 1970 until 1985; thereafter it declined slowly, with rises during the past five seasons. In South Australia both the increases and the declines followed a similar pattern, although the advent of the AFC has increased prices in the last three years.

Another important determinant of sales of any product is real income. Many studies of attendance at sporting fixtures have drawn interesting inferences about the relationship between variations in income and attendance patterns. Average weekly earnings were used to measure the impact of changes in income on the popularity of football in each state.

Much of the attraction of spectator sport is derived from the uncertainty of outcome. Research has tended to confirm the intuitive proposition that spectators will be attracted to (prospectively) even contests. We measured competitiveness by calculating the standard deviation of wins of teams in the competition at the completion of each season. According to this measure a perfectly competitive season would imply each team winning and losing precisely the same number of matches. In recent AFL circumstances this would mean all teams would conclude a 22 match season with 11 wins and 11 losses and our competitiveness index would read zero.

Because of the change in the number of teams in the competition over our data period we developed two competitiveness indexes.

1. The first index was calculated for only the top twelve teams in the AFL/VFL competition, and the top eight in the SANFL. Chart 4 presents this index for the AFL/VFL.

2. The alternative index was the coefficient of variation for all teams in the AFL/VFL and SANFL competition.

Chart 5 shows this for the AFL/VFL.

Chart 4: Competitiveness (AFL/VFL)

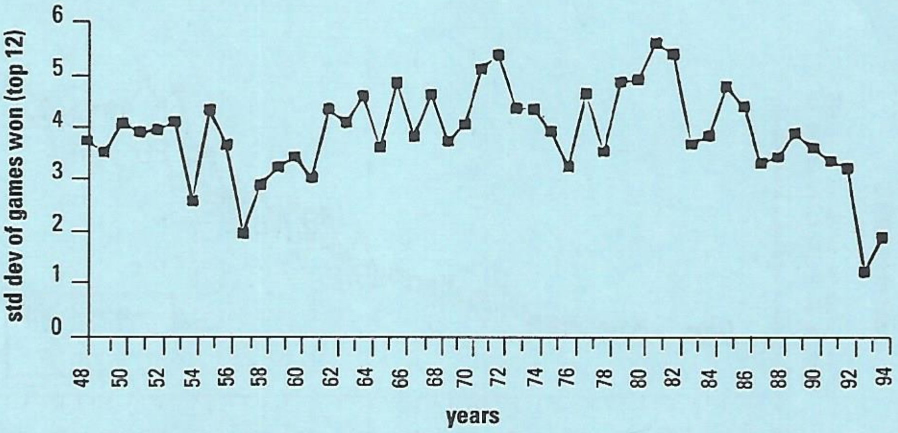
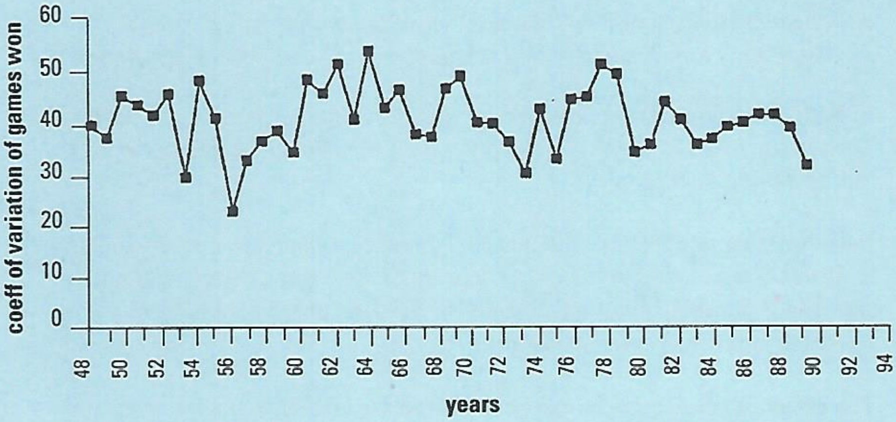


Chart 5: Competitiveness (AFL/VFL)



Although these measures are an indicator of competitiveness it must be remembered that

- in Victoria it was only from 1970 to 1986 that all teams played each other twice, so the measure will be affected by this.
- the AFL/VFL index applies to all games regardless of where they were played, while our AFL/VFL attendance data is for games played in Melbourne and Geelong only.
- in South Australia the index is for SANFL games, but since 1991 approximately half of the attendance in that State has been at AFC AFL games. For the AFL/VFL the two indexes tell slightly different stories, but they both suggest that the draft and salary cap (introduced in the mid to late 1980s) may contribute to greater evenness of the competition.

A number of potentially influential factors were not reviewed, either on the basis of a judgement that they were unlikely to be relevant, or on practical grounds. As aggregate season attendance figures were used game specific factors could not be considered. Factors such as the weather, prior success of competing teams, ground capacity (other than in general terms) and the entertainment value were not considered. We also did not test for the impact of television coverage as matches are virtually never telecast direct to potential spectators. Finally, it is our impression that objectionable crowd behaviour is not a significant negative influence on attendance, notwithstanding occasional incidents of a quite serious nature.

VI. [SIC IV.] Results and conclusions

In earlier sections the paper discussed factors that may be important in explaining attendance at football matches. This section reports the results from a simple econometric model used to test some of the hypotheses (details of the econometrics are in the APPENDIX).

The variables found to be statistically significant were:

- the minimum real price of admission for minor round games
- the number of different days on which games are played during the season
- the construction of the Great Southern Stand at the MCG, which suggests ground capacity is important, and the competitiveness index.

In both cases football supporters were also found to be creatures of habit. This was evident as changes in factors affecting attendance take time before having an influence.

In summary, price matters, attendance is greater if matches are scheduled at different times, competitiveness appears to have some effect, stadium capacity is consequential; but changes to these factors do not have instantaneous effects on attendance.

The effect of price changes can be best seen through an economic measure known as price elasticity. This measures the responsiveness of quantity demanded to changes in price. The short- and long-run elasticities for both Victoria and South Australia have been calculated and are presented in Table 1 of the APPENDIX. Taking Victoria's long- run elasticity as an example, it implies that an increase of 10% in the real price is likely to eventually reduce attendances by approximately 6%. Therefore, the extra revenue derived through charging higher admission prices will only be partly offset by reduced attendance. So the AFL could increase gate receipts by charging higher prices. A similar story can be told about the estimates of the South Australian elasticities. The implication is that in terms of revenue derived from attendance, both the AFL and the SANFL are under charging.

Variables tested and found to be insignificant included:

- real income
- the introduction of new teams into the AFL/VFL
- the unemployment rate, and
- changes in club membership arrangements.

The insignificance of income and unemployment indicates that football cannot be classed as either a normal or an inferior good. Borland (1987) using annual data from 1950 to 1986 found football in Victoria to be a normal good, while Borland and Lye's 1991 study, using weekly data from 1981 to 1986, found football to be an inferior good. Therefore, it may not be surprising to find we cannot be conclusive about how football attendance varies with income. That is, attendance at football matches appears to show a certain amount of insensitivity to changes in people's economic circumstances.

It should also be noted that the introduction of new interstate teams did not significantly affect Victorian attendances. Although interstate teams draw smaller crowds when playing in Melbourne, this appears to have been balanced by the increased interest generated by the advent of a national competition.

To the extent that increased attendance at football matches is deemed the yard stick by which football administrators are judged, we can only endorse their recent actions. Football has become more popular in both

Victoria and South Australia, and the lower real cost of admission, pricing below the revenue maximising point, increased competitiveness, allowing people the opportunity to attend games at different times, ground rationalisation and the move to the national competition (especially in South Australia) seem to have played a part in this.

Appendix

A number of different model specifications and explanatory variables were tested, but the model which performed best for both Victorian and South Australian data was a non-linear partial adjustment model of the form:

$$\Delta \ln ATTEND = \lambda(\ln ATTEND^*_t - \ln ATTEND_{t-1}) \qquad (1)$$

Where ATTEND is average attendance per million people per minor round game and λ is an adjustment parameter. ATTEND* is the equilibrium value of ATTEND and is defined as:

$$\ln ATTEND^*_t = \alpha_0 + \alpha_1 \ln PRICE' + \alpha_2 \ln COMP_t$$

$$+ \alpha_3 \ln DAYS + \alpha_4 D1 \qquad (2)$$

Where:

PRICE = real price of admission to the outer for a minor round game.

COMP = competitiveness index, measured by the coefficient of variation of the number of games won by each team at the completion of all minor rounds. This was thought to be the superior measure of competitiveness.

DAYS = the number of different days on which games are played during the season.

D1 = a dummy variable used to take account of the construction of the Great Southern Stand at the MCG.

Substituting equation (2) into (1) yields the estimating equation:

$$\ln ATTEND_t = \beta_0 + \beta_1 \ln PRICE, + \beta_2 \ln COMP_t$$

$$+ \beta_3 \ln ATTEND_{t-1} + \beta_4 \ln DAYS_t + \beta_5 D1$$

Where:

β_0 = constant, $\beta_1 = \lambda\alpha_1$, $\beta_2 = \lambda\alpha_2$

$\beta_3 = (1 - \lambda)$ $\beta_4 = \lambda\alpha_3$ $\beta_5 = \lambda\alpha_4$

The results for Victoria, using weighted least squares and data from 1948 to 1994 (t statistics in parenthesis).

$\beta_0 = 1.412$,	$\beta_1 = -0.115$,	$\beta_2 = -0.049$
(2.517)	(–3.039)	(–1.027)

$\beta_3 = 0.816$, $\beta_4 = 0.189$, $\beta_5 = -0.160$

(13.688) (3.232) (–7.007)

$n = 46$ $R^2 = 0.918$ $DW = 1.901$

Therefore,

$\lambda = 0.185$, $\alpha_1 = -0.622$, $\alpha_2 = 0.264$

$\alpha_3 = 1.025$ $\alpha_4 = 0.866$

The results for South Australia, again using weighted least squares, but data from 1948 to 1993 (t statistics in parenthesis).

$\beta_0 = 6.005$, $\beta_1 = -02395$, $\beta_2 = -0.103$

(3.817) (–3.990) (–1.346)

$\beta_3 = 0.441$

(2.431)

$n = 45$ $R^2 = 0.890$ $DW = 2.064$

$h = -0.659$

Therefore,

$\lambda = 0.589$, $\alpha_1 = -0.405$, $\alpha_2 = 0.175$

The models were also estimated for various sub-periods but with so few observations very little could be made of these results. The competitiveness coefficients are negative (although insignificant in Victoria and significant only at the 20% level in South Australia). The insignificance of this variable in Victoria may be attributed to the chance correlation between COMP and DAYS (if DAYS is excluded COMP becomes significant).

Table 1: Own price elasticities

	Short Run	Long Run
Victoria	– 0.115	– 0.622
South Australia	– 0.239	– 0.405

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End notes

1 See Cairns *et al.* (1986) for a summary of the previous studies.

2 The AFL was known as the Victorian Football League (VFL) until 1991.

3 Prior to 1982 there were a handful of VFL games played outside Victoria. No attempt was made to consider the impact of attendance at these games.

4 The Victorian data series is 1948 to 1994, the South Australian data is 1948 to 1993.

5 Chart 2 was produced by dividing AFL/VFL attendance per game by Melbourne plus Geelong's population. Adelaide's population was used for SANFL/AFC games. The population figures were derived from Census data.

6 1991 was the year of the construction of the Great Southern Stand at the Melbourne Cricket Ground (MCG).

7 Since 1986 Fitzroy has also spent time at the Junction Oval and Victoria Park, before returning to Princes Park, and in 1994 moved home yet again, this time to Footscray.

8 The first national player draft took place in November 1986, allocating players for the 1987 season. A modified version of the draft, applying to interstate players only, was introduced in 1982.

9 From 1991–93 the South Australian figures are a weighted average of the cost of admission to AFC games and SANFL games.

10 See Cairns *et al.* (1986).

11 A price elasticity formally defined as $\dfrac{\%\text{ change in quantity demanded}}{\%\text{ change in price}}$

12 A normal good is one whose consumption increases as income increases, while for an inferior good consumption falls as income increases.

13 This is consistent with the finding of other studies reported in Cairns *et al.* (1986).

14 The coefficient of variation was thought to be the best measure of overall competitiveness.

15 Following Borland (1987), weighted least squares, and not ordinary least squares, was used to avoid the heteroskedastic component in the error term.

16 The competitiveness index used for the SANFL needs similar qualifications to those mentioned in section V.DAYS and D1 did not apply to South Australia.

Source: *Economic Papers,* vol, 15, no. 1, March 1996, pp. 83–93.

Elasticities of demand and supply

Topic 3

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Introduction

In Topic 2 we studied supply and demand and how they interact to produce market prices and output levels. We saw that changes in prices were either the outcome of shifts in supply and demand or caused by the implementation of certain government controls. In this topic we extend our analysis of changes in the determinants of supply and demand by developing the concept of elasticity, or a measure of sensitivity.

An elasticity measures the impact that changes in one variable (the initiating variable) have on changes in another variable (the respondent variable. The concept is widely used in various branches of economic analysis, for example in the following questions:

- What impact will higher prices have on sales?
- What impact will an increase in advertising have on sales?
- What impact will lower youth wages have on youth unemployment?
- What impact will higher interest rates have on investment?

An elasticity is a generic concept measuring the responsiveness of one variable to changes in another. It is a numerical estimate of the relationship between two variables and is measured as the percentage change in the respondent variable divided by the percentage change in the initiating variable. Expressing changes as *percentage changes* rather than absolute changes effectively provides a size neutral measure of responsiveness.

While elasticities can be calculated for any two related variables, in this unit we concentrate on the four most commonly used measures.

- *price elasticity of demand* (impact of price changes on quantity demanded);
- *income elasticity of demand* (impact of income changes on quantity demanded);
- *cross elasticity of demand* (impact of price changes for other goods on quantity demanded); and
- *price elasticity of supply* (impact of price changes on quantity supplied).

A word of caution. There are a lot of calculations in this and the next topic. These calculations are there to facilitate your understanding of the concepts involved. The emphasis in this, and all other topics, is on understanding and interpreting economic concepts in a decision-making environment. Don't get bogged down with trying to memorise calculations. Work the problems through but concentrate on understanding the concepts.

Objectives

After completing this topic you should be able to:

- define and interpret price elasticities of demand and supply;
- define and interpret cross price and income elasticities;
- analyse the factors that determine the magnitudes of price, cross price and income elasticities;
- relate the concept of elasticity to the slope of a curve; and
- outline the importance of measured elasticity estimates for firm level strategies and government policies.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, Chapter 5.

Readings

Reading 3.1
J.D. Hunger
'Case 1—The Standard Oil Company: British Petroleum loses patience'

Reading 3.2
A.A. Thompson Jr & J.P. Formby
'Why some buyers are less price sensitive than others'

Price elasticity of demand

The law of demand involves the variables price (*P*) and quantity (*Q*). In most (but not all) markets we know that the quantity of a commodity purchased by a consumer (or consumers) changes with changes in price. Thus, price is the initiating variable and quantity is the respondent variable.

We are interested in the price elasticity of demand because there are important relationships between price, marginal revenue, total revenue and price elasticity of demand. From our general definition of elasticity numerically, we can define price elasticity of demand as follows:

> Price elasticity of demand is defined as the percentage change in quantity demanded divided by the percentage change in price.

$$\text{i.e. } \eta = \frac{\text{Percentage change in quantity demand}}{\text{Percentage change in price}}$$

Just why we use percentage rather than just unit change is explained in your text.

☐ *Read the introduction to Chapter 5 and Section 5-1 in Begg et al. (2000), pp. 57–60 (up to 'Elastic and inelastic demand'), for an introduction and background to the discussion that follows.*

We can calculate the price elasticity of demand in two ways:

- at a particular point on a demand schedule (*point elasticity*), or
- in the vicinity of two points on a demand schedule (*arc elasticity*).

Notice that the price elasticity of demand coefficient will always be negative for a normally sloped demand schedule because of the inverse relationship between price and quantity, i.e. an increase in price leads to a decrease in demand, and vice versa. *Economists often ignore the sign when dealing with the price elasticity of demand for normal goods because it is generally negative.* It is the magnitude of the value of the coefficient that is of interest in most cases rather than the sign.

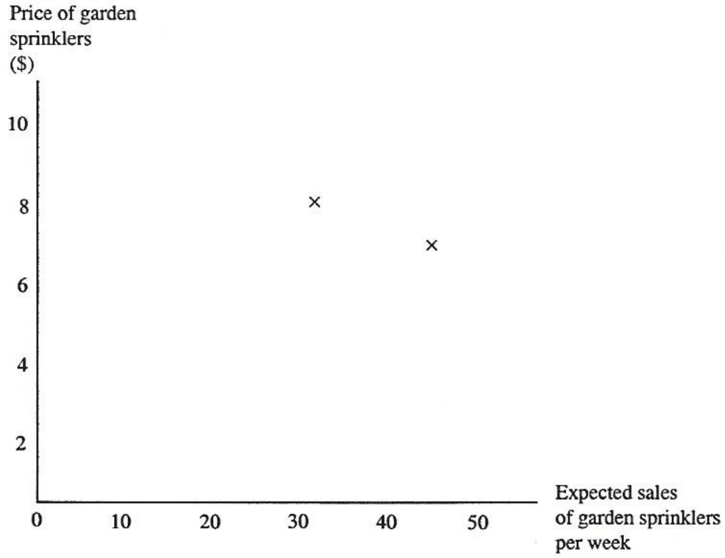
Let's consider arc elasticity first.

Arc elasticity of demand

A typical business person will not usually know the algebraic form or complete graph of the demand curve of a commodity. He or she will rather be faced with a situation such as the example following.

A hardware store has been selling garden sprinklers during the past 3 months at $8 per unit, and sales have consistently averaged 32 per week. The manager now decides to reduce the price to $7 per unit. He expects sales to rise to 44 units per week. Assuming other variables stay unchanged we can plot two points on the demand curve for garden sprinklers (Figure 3.1).

Figure 3.1: **Points on the demand curve for garden sprinklers**



We do not know the complete shape of the demand schedule, but we can still estimate values of demand elasticity within the \$7 to \$8 price range. We do this by using the arc elasticity approach, so called because we are considering two points on a curve and the straight line between them—the arc. The arc elasticity approach is also relevant when we are examining changes in price that are *not* very small.

If η is the price elasticity of demand:

$$\eta = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

$$= \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

$$= \frac{\Delta Q/Q_1}{\Delta P/P_1}$$

(where Δ means change in)

or

$$= \frac{\Delta Q}{\Delta P} \text{ x } \frac{P_1}{Q_1}$$

Confused? Remember, to divide by a fraction—in this case $\frac{\Delta}{P_1}$ in the previous equation—you turn it upside down and multiply, i.e.

$$\frac{\Delta Q/Q_1}{\Delta P/P_1} = \frac{\Delta Q}{Q_1} \text{ x } \frac{P_1}{\Delta P}$$

Then rearranging:

$$= \frac{\Delta Q}{\Delta P} \text{ x } \frac{P_1}{Q_1}$$

Most texts substitute (Average *P*/ Average *Q*) for (P_1/Q_1) in this equation. We will stay with P_1/Q_1 to be consistent with Begg et al. (2000).

If we take P_1 as \$8 then Q_1 is 32, and P_2 is \$7 when Q_2 is 44. Substituting these values in the arc elasticity equation we obtain a coefficient.

$$\eta = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

$$= \frac{(44 - 32)/32}{(7 - 8)/8}$$

$$= \frac{12/32}{-1/8}$$

$$= -3$$

or

$$\eta = \frac{\Delta Q}{\Delta P} \text{ x } \frac{P_1}{Q_1}$$

$$= \frac{12}{-1} \text{ x } \frac{8}{32}$$

$$= -3$$

This means that a 1% increase in price could be expected to produce a 3% reduction in quantity demanded.

We might of course have nominated P_1 as \$7, Q_1 as 44, P_2 as \$8 and Q_2 as 32, in which case the coefficient would be:

$$\eta = \frac{(32-44)/44}{(8-7)/7}$$

$$= \frac{-12/44}{1/7}$$

$$= -1.91$$

or

$$\eta = \frac{-12}{1} \text{ x } \frac{7}{44}$$

$$= 1.91$$

This estimate means that a 1% increase in price could be expected to produce a 1.9% reduction in quantity demanded.

(Note that we have a different result for the first calculation. Can you see why?

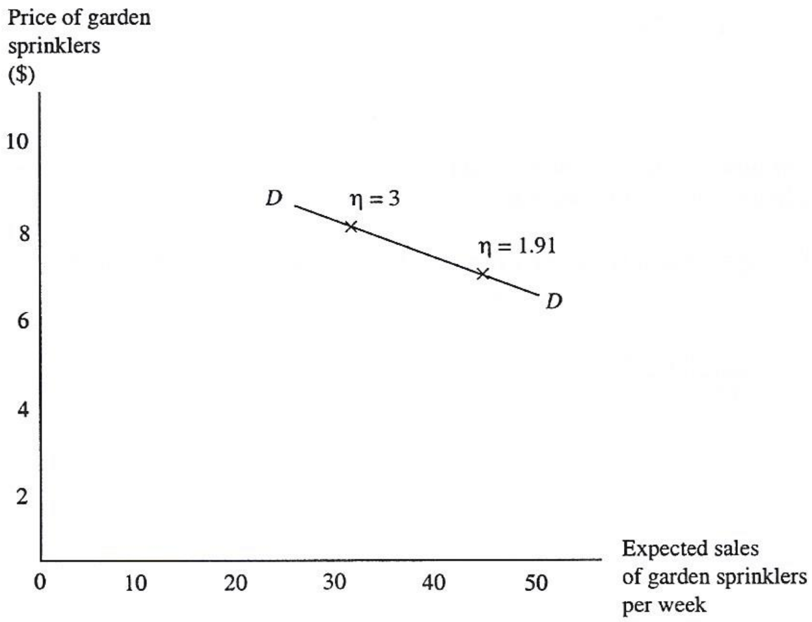
Whilst $\frac{\Delta Q}{\Delta P}$ is the same, our $\frac{P_1}{Q_1}$ figure is different.)

These two coefficients are the price elasticity of demand at the two points on the demand schedule for garden sprinklers. They are shown in Figure 3.2.

From this example note some important points:

- Calculating the arc price elasticity of demand provides only an approximation of the coefficient in the range under consideration. This is because the value of the elasticity coefficient varies over the length of a straight line demand curve.
- The absolute value of the price elasticity of demand coefficient will be between zero and infinity.
- Because arc price elasticity of demand is imprecise, the two values obtained are sometimes averaged (– 2.45 in the above example). There are also variations of the arc elasticity formula which incorporate the averaging process.
- When interpreting price elasticity coefficients, we often ignore the minus sign.

Figure 3.2: **Elasticity coefficients on the demand curve for garden sprinklers**



Point elasticity of demand

While the arc elasticity measures responsiveness over a range, the point elasticity measures the responsiveness of quantity demand to changes in price at a point on the demand curve—so it measures responsiveness of quantity demanded to very small changes in price.

The formula for working out the point elasticity is still the percentage change in quantity divided by the percentage change in price. In this case however, the change in price is taken to be infinitesimally small. Consider the general formula for a price elasticity of demand developed above:

$$\eta = \Delta Q / \Delta P \times P/Q$$

When we are considering a point elasticity, the term $\Delta Q/\Delta P$ is by definition the slope of the demand curve at the co-ordinates P and Q. So, to work out the value of the point price elasticity of demand, we simply multiply the ratio of P to Q by the slope of the demand curve at that point.

For example, calculate the point price elasticity of demand for the following demand curve when $P = 10$ and $Q = 5$.

$$Qd = 10 - 0.5\,P$$

This demand curve is a straight line and the slope is always equal to – 0.5.

Therefore, the price elasticity of demand at $P = 10$ is

$$\Delta Q/\Delta P \times P/Q \text{ or } -0.5 \times 10/5 = -1\text{, or 1 in absolute terms.}$$

This means for each 1% increase in price, there will be a 1% reduction in quantity demanded.

Question 3.1

Using the demand curve from the above example:

(a) Calculate the point price elasticity of demand when the price is equal to 12. [Note that you will first need to compute the value of Q when P is equal to 12.]

(b) Calculate the arc elasticity of demand for a price change from 10 to 12.

(c) Briefly explain why the elasticities in (a) and (b) are different.

There is an alternative approach to calculating point elasticities that is not shown in Begg et al. (2000) and which is not widely used but can be useful in some cases. If we know that the demand curve is linear, or approximately linear, we can rearrange the formula for a point elasticity of demand to obtain the following:

$$\eta = P/P^*$$

where P^* is the *increase* in price that would be necessary to result in zero demand.

Staying with the simply demand curve used in the previous question, we will calculate the point price elasticity of demand when $P = 4$.

Using this approach we do not need to know Q, all we need is the current price and the price level that would cut off all demand.

For the demand equation $Q = 10 - 0.5\,P$, the price that will just cut off all demand is 20. You can obtain this value by trial and error or you can express the demand curve as a price equation, yielding $P = 20 - 2\,Q$. (Transposing, $0.5\,P = 10 - Q$, multiplying both sides by 2, $\therefore\ P = 20 - 2\,Q$.) This price equation is exactly the same demand system as before but it is expressed in terms of price rather than quantity. This price equation shows that if $Q = 0$, $P = 20$. The value of 20 is simply the value of the intercept term on the price axis or where the demand curve cuts the price axis.

So we now know that the value of P^* is $20 - 4$ or 16. In other words, if our market is operating at a price of 4, price would have to increase by 16 units before demand would be zero.

The point price elasticity of demand is then P/P^* or $4/16 = 0.25$.

The advantage of this approach is that it provides a very simply and very precise measure of the point price elasticity of demand. It can be applied to markets or individual consumers alike. Moreover, the information required should be easy to estimate from a manager's knowledge of the market or individual consumer questionnaires. However, the problem with it is that it rests on the assumption that the demand curve is a straight line. If this assumption doesn't hold, the estimates will be unreliable.

Interpretation of coefficients of price elasticity of demand

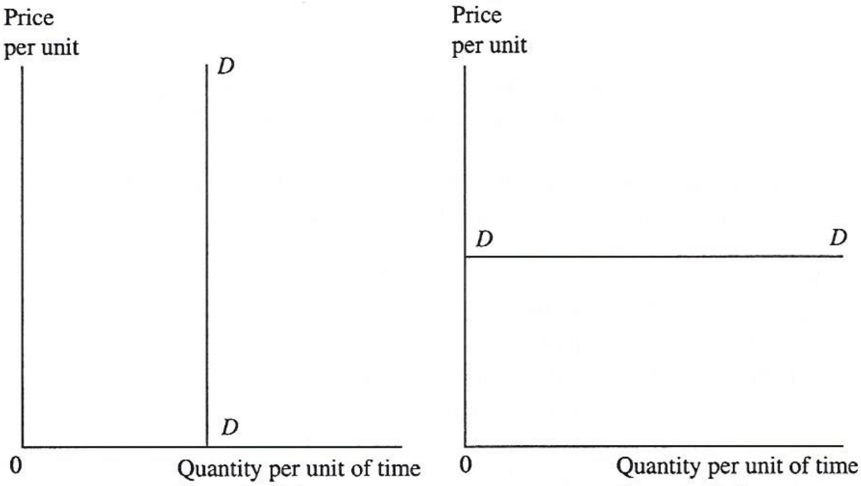
As we have shown, the value of the elasticities varies (and typically falls) as we move down the demand curve.

As your text points out on p. 60 (Begg et al. 2000), the negative 1 (or absolute 1) is by definition the reference point for deciding whether demand for a commodity is elastic or inelastic. In summary:

- If $\eta > 1$ (in absolute terms), demand is elastic.
- If $\eta < 1$, demand is inelastic.
- If $\eta = 1$, demand is unitary elastic.
- If $\eta = 0$, demand is perfectly inelastic.
- If $\eta = \infty$, demand is perfectly elastic.

The last two situations are limiting cases. Illustrations of these demand schedules appear in Figure 3.3.

Figure 3.3: Demand curves with zero and infinite elasticity



Zero elasticity

Zero elasticity

On a straight-line demand curve the price elasticity of demand changes from inelastic through unitary elasticity to elastic (as shown in Figure 3.4). Some people would argue that this is because consumers' sensitivity to price changes is not constant. When price is low the reaction to a price change is small. When price is high the reaction to a price change is larger. However, this really explains why the demand curve may be a straight line rather than why the elasticity varies along its length. The price elasticity of demand always varies along the length of a straight line demand curve because of the generic nature of an elasticity. While this property is determined by arithmetic relationships rather than economic factors, it has important economic implications.

The $\Delta Q/\Delta P$ part of the elasticity formula is always constant along a straight line. Therefore, any change in the second part of the formula, P/Q, will change the value of the elasticity. The value of this P/Q part of the formula increases as you move up the demand curve from zero at the horizontal intercept (where $P = 0$) to infinity at the vertical intercept (where $Q = 0$).

- If price is increased on the *inelastic* part of a demand schedule, total receipts will increase, and vice versa.

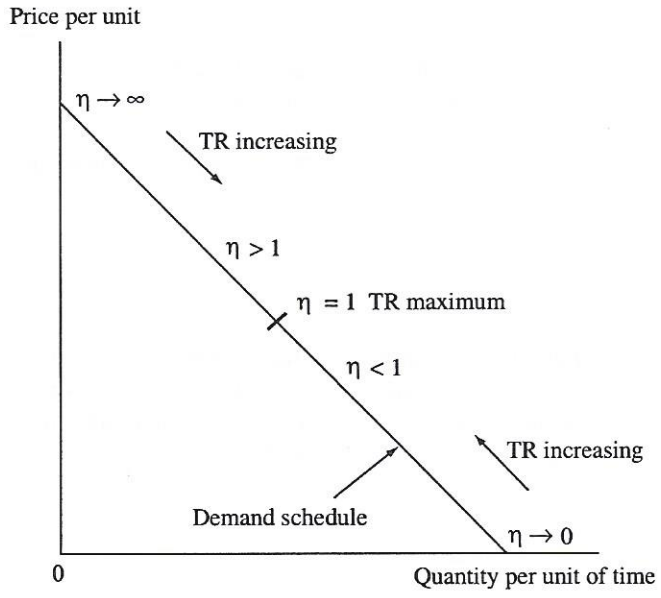
- If price is increased on the *elastic* part of a demand schedule, total receipts will decrease, and vice versa.
- Finally, if price is changed by a small amount at the point of unitary elasticity, there will be no change in total receipts.

Thus in the garden sprinkler example above, we know that the price range \$8 to \$7 is on the elastic part of the demand schedule because η varies between 3 and 1.91; hence the price cut will increase total receipts. This is easily verified.

The concept of price elasticity of demand is therefore obviously important for business people. However this importance should not be overstated. There is a big difference between sales revenue and profit. Knowledge of the value of the elasticity cannot tell us how much to produce or sell. Firms need to know how their costs vary with changes in output as well as how revenue changes with extra sales. The issue of identifying a profit maximising level of output is considered in Topic 7.

The range of elasticity coefficients and relationships with total receipts (TR) are summarised in Figure 3.4.

Figure 3.4: **Changing price elasticity and total receipts over a demand schedule**



Question 3.2

A retailer has been selling 1200 cans per week of 'Glug' at a price of 27 cents per can. It is planned to increase the price to 29 cents per can at which price it is expected that 1050 cans per week will be sold. What is the price elasticity of demand for 'Glug' in this price range?

Question 3.3

Another retailer has been selling 305 tubes per week of 'Blob' at 19 cents per tube. It is planned to increase the price to 20 cents per tube with anticipated sales dropping to 290 tubes per week. In this price range:

(a) What is the price elasticity of demand for 'Blob'?

(b) Is demand price elastic or inelastic?

Factors affecting the price elasticity of demand

A number of factors influence the price elasticity of demand, and some of these are outlined in the next reading.

☐ *Study Reading 3.2 at this point. The reading highlights the fact that elasticity of demand is a function of both the inherent nature of the product and the characteristics of the particular buyer.*

Other factors influencing price elasticity include the relative availability of substitutes, and whether the product is an essential or luxury item.

☐ *Now complete your reading of Section 5-1 of Begg et al. (2000) (beginning 'Elastic and inelastic demand'), and Section 5-2 (pp. 61–3).*

See Table 5.3 of Begg et al. (2000, p. 60) for a short list of items and their elasticities. Can you explain the figures in terms of the factors listed above?

Question 3.4

Suppose you have been appointed Federal Treasurer. You are looking to increase tax revenue through sales taxes and you are not concerned about the impact of these taxes on the pattern of income distribution in Australia. What products would you tax and why?

Income elasticity of demand

We have looked at price elasticity of demand where a consumer's income, and some other factors that influence demand, were assumed to be fixed and where price was the only variable. Now we hold commodity price fixed and allow a consumer's income to vary. We can then observe consumers' responsiveness, or sensitivity, to income changes when all other factors are fixed.

> *Income elasticity of demand* is defined as the percentage change in quantity demanded divided by the percentage change in consumer's income when the change in consumer's income is small.

Thus,

$$\eta_y = \frac{\text{Percentage change in quantity demand}}{\text{Percentage change in consumer's income}}$$

$$= \frac{(Q_2 - Q_1)/Q_2}{(Y_2 - Y_1)/Y_1}$$

$$= \Delta Q/\Delta Y \text{ x } Y/Q$$

where Y_2 and Y_1 are two different levels of a consumer's income.

Note the following characteristics of the coefficient of income elasticity of demand:

- If η_y is positive, the commodity is a normal good; i.e. increases (decreases) in income lead to increased (decreased) consumption of the commodity.
- If η_y is negative, the commodity is an inferior good; i.e. increases (decreases) in income lead to decreased (increased) consumption of the commodity.
- If the commodity is a luxury, η_y is likely to be substantially greater than +1.
- If the commodity is a necessity, η_y is likely to be substantially less than +1 the commodity is likely to be a necessity.
- The income elasticity measure can be applied to the individual consumer or to the total market.
- Presumably some businesses would prefer to supply commodities that are income elastic because any given percentage increase in disposable income leads to a greater percentage increase in sales. In spite of this, commodities which have an income elasticity less than 1 are still produced in an affluent society, but expenditure on these is a small proportion of total income.

☐ *Now read Section 5-6 in Begg et al. (2000), pp. 65–8. Note the value of the information conveyed by income elasticities.*

A particular application of income elasticity is embodied in Engel's law.

Engel's Law and the plight of the farmer

In the nineteenth century, a German statistician, Ernst Engel, etched his name in economic history by proposing what has become known as Engel's law. Engel studied the consumption patterns of a large number of households and concluded that the percentage of income spent on food decreases as incomes increase. That is, he determined that food is a necessity. His finding has repeatedly been confirmed by later researchers. Examples of estimated income elasticities are shown in the following table. Note that only beef has an estimated elasticity greater than unity.

One of the implications of Engel's law is that farmers may not prosper as much as those in other occupations during periods of economic prosperity. The reason is that if food expenditures do not keep pace with increases in gross domestic product, farm incomes may not increase as rapidly as incomes in general. However, this tendency has been partially offset by the rapid increase in farm productivity in recent years. In 1940, each U.S. farmer grew enough food to feed about 11 other people. Today, the typical farmworker produces enough to feed 80 people.

Source: Petersen & Lewis (1994), p. 92.

Question 3.5

Consider the following hypothetical table which plots individual consumption of white wine (in litres per annum) against annual disposable income.

Income (Y) ($ per annum)	*White wine consumed (litres per annum)*
8 000	*5*
12 000	*10*
16 000	*15*
20 000	*18*
24 000	*20*
28 000	*19*

Is white wine a normal or inferior good, luxury or necessity in the income range:

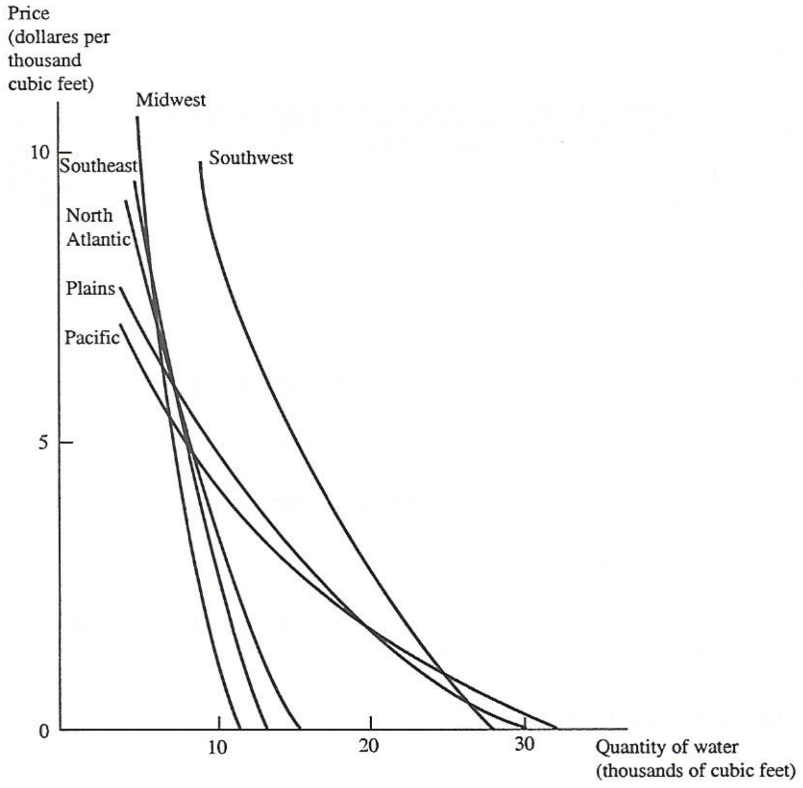
(a) $8 000 to $12 000

(b) $24 000 to $28 000?

Question 3.6

Residential demand for water

Water is obviously of fundamental importance to human beings, no matter where they live. However, this does not mean that the residential demand for water is the same in one region as in another. Henry Foster and Bruce Beattie have estimated the demand curve for water in six regions of the United States. The results, shown below, pertain to new England and the Northern Atlantic region, the Midwest, the Southeast, the Plains and Rocky Mountain region, the Southwest and the Pacific Northwest.



(a) If the price of water is $5 per thousand cubic feet, in which region is the consumption of water highest?

(b) According to their findings, the price elasticity of demand for water in all regions is between 0.39 and 0.69. Why do you think the demand for water is price inelastic?

(c) In those regions where outdoor use comprises a relatively large fraction of total water use, the price elasticity of demand tends to be relatively high. Why?

(d) The demand curve for water in the summer tends to be to the right of the demand curve in the winter, and it tends to be more price elastic than the demand curve in the winter. Why?

Source: Mansfield (1994), pp. 137–8.

Cross elasticity of demand

You are now aware of, and are able to measure, the sensitivity of consumers to price changes for a commodity, or to income changes for a commodity. Another important influence on the demand for a commodity is the price of other commodities. The *cross elasticity of demand* measure enables us to classify pairs of commodities as either *substitute* or *complementary* goods and assess the intensity of any relationship between them.

> *Cross elasticity of demand* between two commodities is defined as the percentage change in quantity demanded of commodity A divided by the percentage change in the price of another, commodity B.

Thus,

$$\eta_{AB} = \frac{\text{Percentage change in quantity demanded of A}}{\text{Percentage change in the price of B}}$$

$$= \frac{\Delta Q_A}{Q_A} / \frac{\Delta P_B}{P_B}$$

$$= \Delta Q_A / \Delta P_B \text{ x } P_B / Q_A$$

Note that the *sign* of the cross elasticity coefficient is important.

- If η_{AB} is positive, A and B are substitute goods.
- If η_{AB} is negative, A and B are complementary goods.
- If η_{AB} is zero, A and B are unrelated.

The cross elasticity of demand measure is usually applied to the total market rather than to individual consumers.

A particular example follows.

Estimation of the price and cross price elasticities demand for oranges by market experiment

In 1962, researchers at the University of Florida conducted a market experiment in Grand Rapids, Michigan, to determine the price elasticity and the cross-price elasticity of demand for three types of Valencia oranges: those from the Indian River district of Florida, those from the interior district of Florida, and those from California. Grand Rapids was chosen as the site for the market experiment because its size, demographic characteristics, and economic base were representative of other midwestern markets for oranges.

Nine supermarkets participated in the experiment, which involved changing the price of the three types of oranges, each day, for 31 consecutive days and recording the quantity sold of each variety. The price changes ranged within +16 cents, in 4-cent increments, around the price of oranges that prevailed in the market at the time of the study. More than 9,250 dozen oranges were sold in the nine supermarkets during the 31 days of the experiment. Each of the participating supermarkets was provided with an adequate supply of each type of orange so that supply effects could be ignored. The length of the experiment was also sufficiently short so as to ensure no change in tastes, incomes, population, the rate of inflation, and determinants of demand other than price.

The results, summarized in Table 4-1, indicate that the price elasticity of demand for all three types of oranges was fairly high (the boldface numbers in the main diagonal of the table). For example, the price elasticity of demand for the Indian River oranges of – 3.07 indicates that a 1 percent increase in their price leads to a 3.07 percent decline in their quantity demanded. More interestingly, the off diagonal entries in the table show that while the cross-price elasticities of demand between the two types of Florida oranges were larger than 1, they were close to zero with respect to the California oranges. In other words, while consumers regarded the two types of Florida oranges as close substitutes, they did not view the California oranges as such. In pricing their oranges, therefore, producers of each of the two Florida varieties would have to carefully consider the price of the other (as consumers switch readily among them as a result of price changes) but need not be much concerned about the price of California oranges.

Table 4-1
Price elasticity and cross-price elasticity of demand for Florida Indian River, Florida Interior and California oranges

Type of orange	Price elasticities and cross-price elasticities Florida Indian River	 Florida Interior	 California
Florida Indian River	**–3.07**	+1.56	+0.01
Florida Interior	+1.16	**–3.01**	+0.14
California	+0.18	+0.09	**–2.76**

Source: Salvatore (1996), pp. 132–3.

Question 3.7

Which of the following are likely to have a positive cross-elasticity of demand?

(a) Cars and petrol.

(b) Wooden tennis racquets and steel tennis racquets.

(c) Gin and tonic.

(d) Fishing rods and fishing licences.

(e) Undergraduate training at a university and undergraduate training at a college of advanced education.

(f) Butter and margarine.

Question 3.8

Electricity demand in the United States

In a 1973 study, D. Chapman, T. Tyrell, and T. Mount estimated that the long-run price elasticity of demand for electricity by all United States residential consumers is 1.2, that the income elasticity of demand for electricity by such consumers is 0.2, and that the cross elasticity of demand for electricity with respect to the price of natural gas is 0.2.

(a) If the price of electricity to residential consumers is expected to rise by 1 per cent in the long run, by how much would the price of natural gas have to change to offset the effect of this increase in electricity's price on the quantity of electricity consumed?

(b) An economist studies the behaviour of residential consumers in a Chicago suburb and finds that, holding other factors constant, there was the following relationship between their aggregate money income and the amount of electricity they consumed:

Aggregate income (millions of dollars)	***Quantity of electricity consumed***
100	***300***
110	***303***
121	***306***

Is this evidence consistent with the results presented by Chapman, Tyrell and Mount? If not, what factors might account for the discrepancy?

(c) Does your answer to part (b) depend on the units in which the quantity of electricity consumed is measured in the table above?

(d) Would you expect the income elasticity of demand and the cross elasticity of demand to be higher or lower in the short run than in the long run? Why?

Source: Mansfield (1979), p. 120.

Price elasticity of supply

Price elasticity of *demand* is a measure of *consumers'* responsiveness to price changes when other factors which affect demand are held constant. Similarly, price elasticity of *supply* is a measure of *producers'* willingness or ability to vary production when a commodity price changes. Producers' responsiveness to price changes is related to the ease or difficulty with which the firm can reorganise factors of production in the short run. In agriculture, for example, supply tends to be inelastic because, if price changes, output cannot be varied in the short run. In manufacturing the producer is more likely to be able to respond quickly to price changes. Hence, supply is more price elastic.

Price elasticity of supply varies over the length of most supply schedules. As with price elasticity of demand, price elasticity of supply can be calculated at a point on the schedule or over an arc, but we shall ignore point elasticity of supply. Because of the similarities with price elasticity of demand, the procedures for calculating price elasticity of supply are stated concisely. Notice that the sign of price elasticity coefficients of supply is positive for normally (i.e. upwardly) sloped schedules.

> The *elasticity of supply* is defined as the percentage change in quantity supplied divided by the percentage change in price *when the price change is small.*

Thus,

$$\eta_s = \frac{\text{Percentage change in quantity supplies}}{\text{Percentage change in price}}$$

$$\eta_s = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

$$= \Delta Q/\Delta P \times P/Q$$

In comparison to the elasticity of demand, two points follow:

- The similarity with arc elasticity of demand is obvious.
- Notice again that arc price elasticity of supply provides only an approximation of the coefficient in the range under consideration.

Time and elasticity of supply

Time is an important factor affecting the elasticity of supply. When output cannot be quickly varied, supply is inelastic. If, in addition, the commodity is perishable, supply may be perfectly inelastic. If the commodity can be successfully stored, supply will be less inelastic—but inelastic nevertheless. This scenario fits many agricultural products. In manufacturing industry, however, output can usually be varied more quickly and the products can be stored. Hence supply of manufactured goods is likely to be more elastic.

The following comment from Marshall (1970, p. 549) illustrates how elasticity of supply changes from the very short run through the short run to the long run:

> In the short run, under constant conditions of supply, elasticity or flexibility is limited by the ability of producers to adjust factor combinations with existing capacity. Over a longer period of time, however, capacity, or techniques, or general conditions of supply can themselves be altered—thus permitting much greater freedom of action, flexibility, responsiveness or bargaining power to producers.
>
> Economists refer, in fact, to three categories of supply, distinguished by the length of the time period. They may be illustrated by the example of the fishing industry. Present short-run capacity and techniques in the industry—the conditions of supply—are fixed. There are so many boats, owners, captains and fishermen. From one sailing to the next they can alter the quantity produced by working harder or less hard, for longer or shorter hours, and with bigger or smaller crews. At each production run, or sailing, however, decisions will have been made, and the catch will be more or less predetermined. Once the catch is made, and landed, it is fixed and unalterable. It constitutes supply in the market (or immediate short-run) period. Supply will be perfectly inelastic, forming a vertical line.

If demand (which can fluctuate or 'shift' very quickly from one sailing to the next—influenced by weather, meat prices, etc.) happens to have risen, then market price will be high. Price will be determined entirely by demand. If demand has fallen, price will be low. The only way to alter supply (the quantity available to sell) will be to wait until the next production run or sailing, adjusting factors so as to ensure a larger or smaller catch. Thus, from one catch to another—over the short run, within the limits of existing capacity and techniques—supply will be more elastic. The supply curve will be of the conventional shape, and the various quantities made possible constitute supply in the short period (or short-run supply). However, fluctuations or 'shifts' in demand may not be oscillating and temporary, but may follow a long-term trend upwards or downwards. In this case supply cannot be increased greatly or cut back to nil *in the short run*, from one sailing to the next, because in the first case capacity and techniques are limited, and in the second case the boats, equipment, captains and crews cannot just be 'put into mothballs' or be applied to another product. Factors can only work harder or not as hard, within the confines of existing supply conditions. Nevertheless, over a longer period new boats may be built, new owners may enter the industry and new captains and crew may be trained. Alternatively, old boats may not be replaced by more and better boats, and owners, captains and crews may retire and not be followed by their sons. Thus supply *in the long period* (or long-run supply) will be more flexible than in the short run. Capacity and techniques, in other words, may be more easily altered in the long run, thus making supply more elastic over the course of time.

Empirical estimates of elasticities

Before we complete this topic it should be pointed out that business people and economists have undertaken many empirical studies which have endeavoured to estimate the shapes of demand and supply curves and the size of various elasticities associated with them. The three general techniques used to do this are:

- *Direct market experiment.* Mansfield (1979, p. 129) quotes the following exercise undertaken by the Parker Pen company with respect to Quink ink:

  The Parker Pen Company conducted an experiment some years ago to determine the price elasticity of demand for Quink. They raised the price from 15 cents to 25 cents in four cities and found that demand was quite inelastic. Also, in some stores, the old package selling at 15 cents was put next to a package marked 'New Quink, 25 cents'; the results also indicated that demand was quite inelastic.

- *Consumer interview and questionnaire.*

- The use of sophisticated *statistical estimation* (or econometric) *techniques*.

Each of these techniques has had limited success.

Many of the interesting results available are from published econometric studies. Such results are regularly quoted in microeconomics textbooks. The two summary tables are examples of two well-known Australian studies for particular commodity groups.

Table 3.1: Estimates of price elasticities of demand for Australia

Commodity Group	*Elasticity*	
	Price	*Income*
Books and newspapers	0.21	0.38
Rail transport	0.21	0.39
Soft drinks	0.22	0.39
Confectionery	0.22	0.39
Beer	0.40	0.72
Motor vehicles	0.58	1.03
Wine and spirits	0.60	1.08
Health services	0.68	1.20
Electronic equipment	0.74	1.33
Communications	0.76	1.37
Restaurants	0.84	1.51
Air transport	1.01	1.84

Source: McTaggart et al. (1996), pp. 104, 109.

Note that the commodities in Table 3.1 are all nearly all price inelastic. This tends to be a characteristic of broad commodity groupings and the more aggregated the commodity group, the lower will be the elasticity. This can be explained in terms of the presence of substitutes. For example, although there are few effective substitutes for electronic equipment, there are many substitutes for any individual item of electronic equipment, and even more for any particular brand.

Table 3.2: Estimates of price elasticity of supply in Australia

Product	*Over 1 year*	*Over 5 years*
Wool	0.051	0.248
Lamb	0.206	0 935
Wheat	0.181	0.823
Coarse grains	0.212	0.805
Dairy products	0.196	0.429

Source: Gruen et al. (1967), p. 169.

Table 3.2 shows, as we pointed out earlier, that elasticity of supply will tend to rise as a longer period of adjustment is allowed. While these figures were estimated in 1967, they are probably still a reasonable reflection of the current situation. The magnitude of the price elasticity of supply is heavily influenced by the technological constraints on production. Although there has been rapid technological change in these industries, it has had no major impact on the time that is needed to expand production levels.

While a considerable time was spent in this topic looking at different ways of calculating elasticities, the actual calculation process may not be feasible or unnecessary in some cases. However, even under these circumstances, good decision makers develop notions of the relative values of the elasticities of key variables driving supply and demand. They know how sensitive their sales are to changes in competitors' prices as opposed to changes in advertising budgets. The real question from a managerial perspective is not if elasticities are relevant to decision making, but whether managers need and can justify formal statistical analysis or whether they can rely on subjective estimates based on industry experience.

Price elasticities and slopes of curves

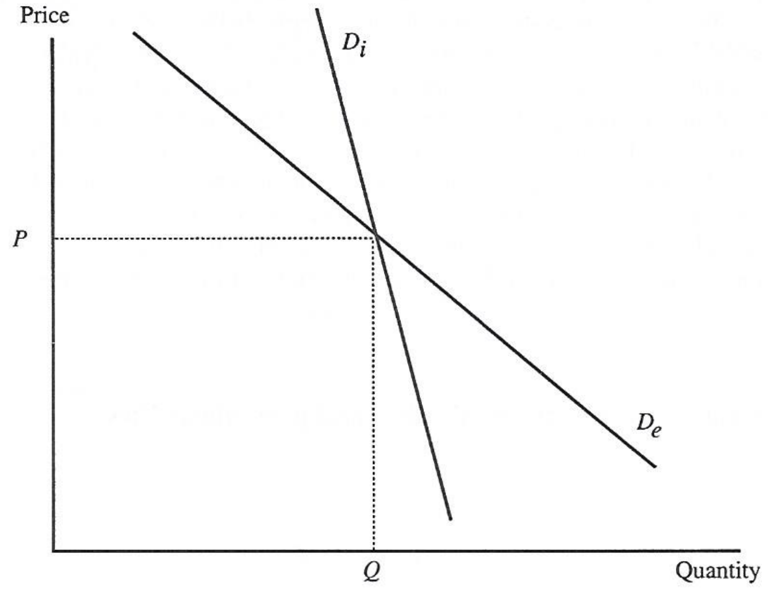
You will recall that the value of an elasticity varies along the length of a straight line (linear) demand curve. The proof of this can be readily appreciated when one examines the formula for a point elasticity i.e. $\eta = \Delta Q/\Delta P \times P/Q$. Remember that $\Delta Q/\Delta P$ represents the slope of the demand curve and this is constant for a linear curve. Therefore, for any given linear demand curve the value of the point price elasticity of demand will change as we vary P. This holds as long as changes in P lead to changes in Q.

For a linear demand curve this holds in all cases unless the demand curve is vertical. In this case the price elasticity is equal to zero regardless of the value of P. The other polar case is where the demand curve is perfectly horizontal and the price elasticity is equal to infinity for all levels of Q (see Figure 3.3).

Despite the fact that elasticities vary along the length of a straight line demand curve, analysts commonly draw two straight line demand or supply curves and evaluate alternative market scenarios on the basis of one curve representing an elastic market and the other representing a relatively inelastic market. This approach is valid as long as we are referring to market conditions around one price-quantity point.

Refer to the case portrayed in Figure 3.5. We can correctly say that D_e is more elastic than D_i as long as we are analysing the point where the two curves cross. At this point we can conclude that the flatter curve is the relatively elastic curve even though both curves have elastic and inelastic segments. We can draw this conclusion directly from the formula for a point elasticity ($\eta = \Delta Q/\Delta P \times P/Q$). As you can see from the diagram, P/Q is the same for each curve at the point of intersection. Therefore differences between the elasticities of the two curves must be completely explained by differences in $\Delta Q/\Delta P$ or the slopes of the curves. Given D_e is flatter than D_i it must follow that the point price elasticity of demand for D_e is greater than for D_i.

Figure 3.5: **Relationship between the slopes of curves and elasticities**



We cannot conclude anything about the absolute values of the two elasticities without the actual values for P, Q and the slopes of the curves. It is also important to remember that this approach is only valid around the point where the two curves intersect. The further we move away from the point of intersection, the less confidence we can have in judgement about the relative elasticities.

The implications of non-linear curves are discussed by Begg et al. (2000), p. 58.

Applications of elasticities

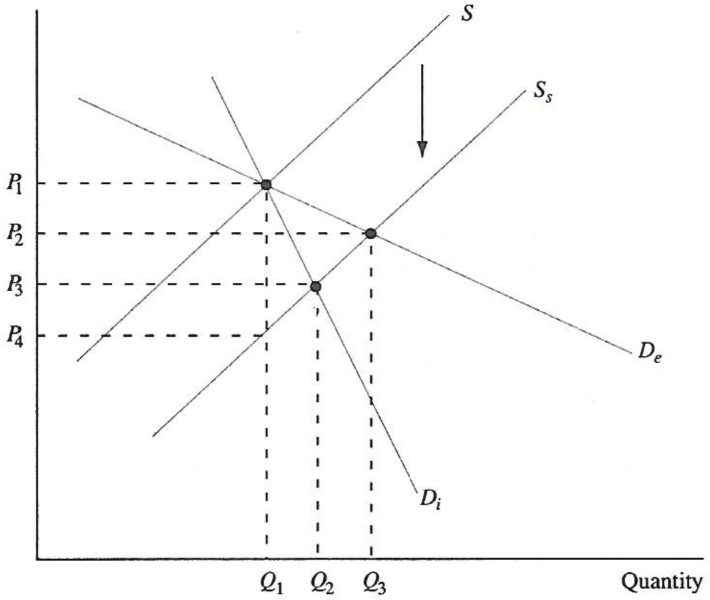
Elasticities are applied concepts. You should make sure you understand applications of the price elasticity of demand discussed in the next reading from your text. In the three examples Begg et al. (2000) give, the change that the market is confronting is from shocks on the supply side of the market. The problems are couched in terms of changes in supply causing changes in market price rather than the other way around. The responsiveness of market price to changes in quantity is often referred to as the *price flexibility* of demand. Under some not overly restrictive assumptions we need not consider here, the price flexibility is equal to the inverse of the price elasticity of demand. This means that if the price elasticity of demand is equal to – 0.5 the price flexibility of demand will be equal to 2. In other words the less responsive is quantity to changes in price, the more responsive will price be to changes in quantity.

☐ *Read sections 5-3 and 5-4 in Begg et al. (2000), pp. 63–5.*

Application of elasticities to the evaluation of production subsidies

Many governments have used production subsidies at one time or another. They use them to make production in on area relatively more attractive and profitable than would be the case in a free market. The impact that a production subsidy will have on industry output and price depends on the price elasticities of supply and demand. Consider the case in Figure 3.6. If we assume that the industry supply curve is *S* and the market demand is D_e, in the absence of government intervention, the market outcome would be P_1, Q_1. Now suppose that the government thinks that this quantity is too little and decides to directly subsidise production in the industry. Firms receive the market price for their output from consumers plus a per unit subsidy from the government for each unit sold.

Figure 3.6: Production subsidies and price elasticities



Under the subsidy scenario the producers have an effective supply curve equivalent to *Ss*. This curve is equivalent to the original supply curve *S*, less the per unit subsidy ($P_1 - P_4$). The new equilibrium price is now P_2 and the quantity is Q_3.

If we assume the demand curve is relatively inelastic (demand curve D_i) the subsidy would cause output to only expand to Q_2, but the price paid by consumers would fall by a greater margin to P_3. The subsidy paid by the government to achieve this change is the level of output (Q_2) times the extent of the per unit subsidy ($P_4 - P_1$). This cost can be compared with Q_3 times the per unit subsidy with the more elastic demand curve D_e.

We can see that understanding the value of the elasticity of demand is critical to governments in terms of predicting the outcome of the subsidy and the total cost of the scheme to taxpayers.

You can now re-examine this case looking at the implications of assumptions about the magnitude of the price elasticity of supply holding the slope of the demand curve constant. Re-draw the diagram holding the demand curve constant as D_i and impose another more elastic supply curve that cuts the original supply curve at the starting equilibrium level.

You will find that the more elastic the supply curve is, the greater will be the expansion in output, the lower the market price and the higher the cost to taxpayers from the scheme.

Summary

In this topic we extended our analysis of the properties of demand and supply curves commenced in Topic 2 by introducing the concept of an elasticity. We saw that an elasticity is a useful way of measuring the impact of one factor, say price, on another factor, say sales. We have analysed demand and supply elasticities, seen how they are estimated, and considered their relevance to firm level decision making. In terms of pricing strategies we found that increasing prices with price inelastic demands will increase revenue while increasing prices for products characterised by elastic demand curves will depress sales revenue. Finally, the importance of elasticity estimates for government policy was also covered.

We have now finished our introduction to the analysis of demand. In Topic 7 we will study the supply side of the market. This will involve an analysis of the relationship between inputs and outputs in a production system and it will be shown that this relationship is reflected in the costs that firms face.

Review questions

Review question 3.1

Briefly explain the meaning of the following concepts introduced in this topic (each in thirty words or less):

- ***the market demand curve for a commodity;***
- ***the market-supply curve for a commodity;***
- ***market-equilibrium prices and quantities for a commodity;***
- ***cross elasticity of demand;***
- ***arc elasticity of demand;***
- ***price elasticity of supply; and***
- ***income elasticity of demand.***

If you have any problems check with your text and the study guide. Set answers are not provided.

Review question 3.2

Closely read Reading 3.1 and answer questions (a) – (g) at the end of the article.

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Suggested answers

Topic 3

In-text questions

Question 3.1

(a) -1.5

(b) -1.222

(c) The point elasticity measures the responsiveness at a point on the demand curve while the arc elasticity measures the responsiveness over a range on the curve. When the demand curve is a straight line, these measures will differ.

Question 3.2

Price elasticity of demand for 'Glug'

$$\Delta P = 2;\ \Delta Q = -150$$

$$\eta = \frac{\Delta Q}{\Delta P} \text{ x } \frac{P_1}{Q_1}$$

$$= \frac{-150}{2} \text{ x } \frac{27}{1200}$$

$$= -1.69 \text{ (at } P_1 = 27 \text{ cents)}$$

or

$$\eta = \frac{-150}{2} \text{ x } \frac{29}{1050}$$

$$= -2.07 \text{ (at } P_1 = 29 \text{ cents)}$$

Price elasticity ranges between 1.69 and 2.07 (1.88 average). In this price range, demand is price elastic, hence total receipts will fall if price is raised by 2 cents and the sales forecast at 29 cents per can is accurate.

Question 3.3

Price elasticity of demand for 'Blob'

(a) $\Delta P = 1; \Delta Q = -15$

$$\eta = \frac{\Delta Q}{\Delta P} \times \frac{P_1}{Q_1}$$

$$= \frac{-15}{1} \times \frac{19}{305}$$

$$= -0.93$$

$$= -0.93$$

Demand is inelastic

or

$$= \frac{-15}{1} \times \frac{20}{290}$$

$$= -1.03$$

Demand is elastic.

(b) The purpose of the question is to demonstrate why the price change must be small. Here the two prices bridge the unitary elasticity point, hence at one point demand is inelastic and at the other elastic. The larger the price change the more likely is this occurrence and, if elasticity is only calculated at one point, the greater is the danger of incorrect predictions about the impact of price changes on total receipts.

Question 3.4

You would most likely impose taxes on goods that have a very low price elasticity of demand. These are staple items and 'necessities' such as beer and cigarettes. The production and consumption impact of a sales tax is smaller the lower the value of the elasticity.

Question 3.5

Income elasticity of demand: white wine

(a) $$\eta_y = \frac{\Delta Q}{\Delta Y} \times \frac{Y_1}{Q_1}$$

$$= \frac{5}{4000} \times \frac{8000}{5}$$

$$= 2$$

or

$$= \frac{-5}{-4000} \times \frac{12\,000}{10}$$

$$= 1.5$$

η_y is positive and greater than 1, therefore white wine is a normal good which can be classed as a luxury.

(b) $$\eta_y = \frac{\Delta Q}{\Delta Y} \times \frac{Y_1}{Q_1}$$

$$= \frac{-1}{4000} \times \frac{24\,000}{20}$$

$$= -0.3$$

or

$$= \frac{-1}{4000} \times \frac{28\,000}{19}$$

$$= -0.37$$

In this income range, white wine is an inferior commodity (perhaps the individual prefers expensive, imported red wines) and is regarded as a necessity.

Question 3.6

(a) Southwest.

(b) Because there are few good substitutes for water.

(c) Outdoor use of water is less essential than the use of water for drinking, cooking, and bathing purposes. Thus the quantity of water demanded for outdoor use is more sensitive to price than is the quantity of water demanded for drinking, cooking and bathing purposes.

(d) Because more water for outdoor use is demanded in the summer, and because this demand is relatively price elastic for the reason given in the answer to part (c).

Source: Mansfield (1994), p. 138.

Question 3.7

Positive cross elasticity of demand

(b), (e) and (f). Some may argue that the goods in e are complementary rather than supplementary.

Question 3.8

Electricity demand in the United States

(a) A 1 per cent increase in the price of electricity would cut electricity consumption by 1.2 per cent, because the price elasticity of demand is 1.2. The cross elasticity of demand for electricity with respect to natural gas is 0.2. But we need a 1.2% effect on electricity to negate the price rise. Thus, if the price of natural gas was to increase by about 6 per cent (i.e. 6 x 0.2 = 1.2), this would offset the effect of the increase in electricity's price.

(b) Based on the data in the table, a 10 per cent increase in income seems to result in about a 1 per cent increase in electricity consumption. Thus the income elasticity seems to be about 0.1, not 0.2, as reported by Chapman, Tyrell, and Mount. This discrepancy could be due to the fact that the inhabitants of this suburb regard electricity to be more of a necessity than do all Americans. (Chicago's weather may have something to do with it!)

(c) No. Regardless of what the units may be, the income elasticity is the same—namely, about 0.1 as pointed out in the answer to (b).

(d) Both would be expected to be lower in the short run because consumers have less time to adapt to changes in income or the price of natural gas. In fact, Chapman, Tyrell, and Mount found both to be about 0.02 in the short run.

Review questions

Review question 3.1

Please refer to your text book and study guide if you have any problems.

Review question 3.2

(a) The price of any business is going to be determined by the value of the stream of net benefits that come from the ownership of the business. This stream of net benefits is going to be heavily influenced by what happens to future process and sales volumes. Both of these can only be forecasted if you understand the basics of supply and demand for the product involved.

(b) McIvor has put forward a supply driven picture of the future of the market. You also need to consider demand, and in this case the price of substitute products seems to be the critical factor he has left out. The potential for technology to substantially reduce extraction costs and open up new reserves also seems to have been largely underestimated.

The actual trend in real oil prices has not supported his view of the market. Oil prices, along with the prices of most primary products, have tended to decline in real terms in the long run.

(c) Tussing's model of the market seems to take both supply and demand changes into account and as such probably provides a more valid summary of where the market is going. However, his model seems to imply that the demand for oil is very price elastic. Current trends in prices seem to support his general view about the impact of technology but his implied elasticities may be too high.

(d) At \$10 a barrel, demand would be 21 billion barrels and would fall to 20 billion barrels if the price rose to \$20. In 1986 oil averaged around \$14 per barrel. At this price the demand curve implies a consumption of 20.6 billion barrels. The own price point elasticity of demand at this level is $-0.1 \times 14/20.6 = -0.07$. This means demand is highly inelastic to price changes. This is not consistent with Tussing's case.

(e) These factors tended to depress the demand for copper resulting in lower prices and lower equilibrium quantities.

(f) Yes, a decrease in the rate of growth of electricity generation would reduce demand for copper, as would technological change that enhanced the position of aluminium and fibre optics as substitutes.

(g) In forming your recommendation you should take into consideration some of the concepts and perspectives developed from your involvement in decision making in your organisation or covered in other units.

Case 1—The Standard Oil Company: British Petroleum loses patience

Reading 3.1

J. David Hunger

It was April 14, 1987 and the members of the special committee of Standard Oil's board of directors were in a quandary. The committee had only nine days to decide what to recommend to the minority stockholders regarding the offer by British Petroleum (BP) to buy the 45% of Standard's shares BP did not already own. British Petroleum was offering $70 a share, but the committee worried that the price was too low. A report to the special committee prepared by First Boston Corporation argued that the shares not owned by BP had an acquisition value of at least $85 per share—significantly higher than BP's offer.

The special committee, composed of the seven outside members of Standard's board of directors, had been unable to decide upon a recommendation. Because of differing valuations of the company, the committee had proposed that Standard's board not take a position on British Petroleum's offer until April 23—only five days before BP's offer expired. Douglas Danforth, committee chairman, knew that the matter could be delayed no longer. What should the committee recommend?

Background

Standard Oil of Ohio was officially established as an independent firm in 1911 when the United States Supreme Court ordered the giant Standard Oil Trust to divest itself of holdings in 33 other companies. The largest, Standard of New Jersey, eventually became the successful Exxon Corporation. Standard Oil of Ohio, in contrast, was established as a one-state marketer with obsolete and inadequate refining capacity. Even though it continued to operate under the original Standard Oil charter signed by J. D. Rockefeller in 1870, the company owned no crude oil and no pipelines. Its assets in 1911 were only $6.6 million, consisting of Rockefeller's original Cleveland refinery, some storage tanks, and wagons. Reduced to the status of buying and selling other companies' oil, Standard of Ohio concentrated on marketing gasoline to the developing automobile market. Its red, white, and blue SOHIO signs shone from attractive service stations located on the most desirable intersections throughout Ohio. It also marketed in contiguous states under the name

'Boron.' Standard's marketing expertise made the firm a very strong competitor. Nevertheless, until 1970, Standard Oil or Sohio, as it referred to itself, was a very minor player in the global petroleum industry.

In 1970, Sohio exchanged a special stock interest equal to about a 25% stake in Standard Oil to acquire British Petroleum's U.S. interests which included large Alaskan holdings where rich deposits of oil were believed to be located. This gave Sohio a 50% share of what became the 1.5 million barrel-a-day Prudhoe Bay oil field. The company also took over management of the Sinclair/BP operation which ranged from Texas to New England. In return, the British company obtained two seats on Sohio's 15-person board of directors, a voice in Sohio's spending plans, a healthy infusion of cash in the form of dividends from Sohio, and an experienced U.S. marketer for its Alaskan oil. Based on a formula tied to Prudhoe Bay crude oil production, British Petroleum (BP) gained a 53% majority interest in Standard and a third seat on its board of directors by 1978.

The huge cost of environmental battles plus inflation increased the price of the Prudhoe Bay oil pipeline from its initial 1971 estimate of $900 million to $9.3 billion at completion in 1978, thus forcing Sohio to borrow approximately $4.6 billion to pay its share of construction costs. Fortunately, world oil prices began to soar with the 1973 OPEC oil embargo. The bold gamble paid off when the oil started flowing from Alaska. Sohio suddenly found itself in 1978 among the major oil companies, ranking ninth in total assets. Prudhoe Bay, however, accounted for 80% or its assets, about 97% of its oil production, and more than 85% of its profits. Standard Oil of Ohio became the holder of one of the largest U.S. oil reserves, as well as one of the largest companies in the United States. By 1981, Sohio's earnings of $1.95 billion were more than 46 times its profits of 10 years earlier.

Realizing that the flow of oil coming from Prudhoe Bay was likely to decline in the late 1980s, and with it the huge annual cash profits, the top management of Sohio set in motion in 1978 a two-pronged strategy of (1) expanding oil and gas exploration and (2) diversifying into energy-related industries. Spending billions of dollars for exploration rights, the company began actively searching for oil in the lower 48 states and the Gulf of Mexico. From 1977 when Sohio spent only $20 million on exploration to 1982 when its exploration/production capital expenditure budget was $1.96 billion, Standard attempted to find enough oil to reduce its heavy dependence on Prudhoe Bay. It increased its exploration staff from 60 in 1977 to nearly 1,000 by the end of 1983. Seeking to expand beyond its current operations, Standard acquired in 1984 Truckstops Corporation of America with its facilities along interstate highways in 15 states and Gulf Oil Corporation's refining and marketing properties in the 8 south-eastern states of Kentucky, Tennessee, Alabama, Mississippi, Georgia, Florida, South Carolina, and North Carolina. The company also spent money on a number of unprofitable ventures as well as some that may be profitable in the long run.

Disappointing Kennecott acquisition

By far, however, the company's two largest investments, Kennecott and Mukluk, were unsuccessful. In 1981, Sohio purchased the nation's largest copper producer, Kennecott Corporation, for $1.77 billion. Unfortunately for Sohio, the price of copper soon began to drop precipitously as foreign copper producers began to oversupply the world market. Attempting to stem Kennecott's losses, Standard acted to close Kennecott's abrasive operations (part of Carborundum, which Kennecott had earlier purchased) as well as to cut back and modernize copper operations. Even with these cost-cutting moves, by end-1985 Kennecott lost a total of $702 million (in operating losses) since its purchase by Sohio.

The 12 major U.S. copper producers were operating in 1985 at 59% of capacity and were in danger of going out of business. By keeping output high, Third World competitors, such as Chile (where ore was twice as rich in copper, as most U.S. mines) kept prices around 67 cents per pound in 1985 (about half the 1980 prices) versus the 82 cents per pound average cost of U.S. production. Nevertheless, in 1985, Sohio's top management decided to spend $400 million on a three-year modernization program of Kennecott's gingham Canyon mine in Utah. The stated goal was to make Kennecott profitable by 1989 by reducing the costs of producing copper from 75 cents to around 45 cents a pound. Sohio's top management may have had little choice given the estimated costs of closing the Bingham mine at anywhere from $500 million to $5 billion depending on environmental and severance pay requirements.(l)

Costly Mukluk exploration

Realizing that it needed a big oil strike to replace the $6 billion in annual revenues from Prudhoe, Sohio invested heavily in a prospect called *Mukluk* in the Beaufort Sea. After an estimated cost of $1.7 billion for leases and drilling 14 miles off Alaska's north coast, the exploratory well was found on December 3, 1983 to contain water, not oil. Even though this was the most expensive 'dry well' in history, Sohio's top management continued to push for continued exploration both in Alaska and in the lower 48. 'Because we want to replace Prudhoe, we need to do some elephant-hunting,' said Richard Bray, head of Sohio's exploration and production unit. 'But because most times you don't bag one, you also need to go after rabbits, squirrels, anything that's out there.'(2)

Unfortunately, after spending nearly $5 billion on exploration and leases from 1980 to 1985, the company had replaced only a little more than a third of the oil it had produced during that time. By early 1986, management estimated that output from Prudhoe Bay would begin to decline at a rate of 10 to 12 percent a year beginning in 1988. 'If they had gone out three or four years ago (1982-1983) and bought an independent oil company, they would have been in a substantially better position,' stated Lawrence Tween, an oil analyst for Kidder Peabody and Company.(3) During the fourth quarter of 1985, Sohio finally cut its aggressive annual oil exploration budget by $200 million and reduced its exploration personnel by 600 employees. The 1986 and 1987 exploration budgets were subsequently cut even further.

Sohio becomes Standard Oil

In February 1986, Sohio changed its name to 'The Standard Oil Company.' This appeared to reflect its desire to become more like the company John D. Rockefeller had founded 116 years before. In their February 19, 1986 letter to shareholders and employees, Alton Whitehouse, chief executive officer and chairman of the board, and John Miller, president and chief operating officer, stated:

> We are the original Standard Oil Company, founded by John D. Rockefeller in Cleveland in 1870. All other Standard Oil Companies that were a part of The Standard Oil Trust have either disappeared entirely or have changed their corporate names. Standard Oil also says plainly that we are primarily in energy, a field where we have attained a major stature and where we intend to remain and continue to grow. It is a strong corporate name with a proud heritage and we plan to use it widely. (4)

In a speech to security analysts in early February 1986, Whitehouse reported that he had succeeded in streamlining the company's work force and asserted that 'we're ready to handle the worst.'(5) Taking over from Charles Spahr in 1978 as chief executive officer, Alton W. Whitehouse, Jr. had worked hard to transform Sohio from a small regional marketer/refiner into a major integrated oil company. Coming to the company in 1968 as the firm's first chief legal counsel, Whitehouse represented Sohio in the negotiations with British Petroleum. He subsequently became Sohio's president in 1970 and its vice-chairman in 1977. Admitting his lack of technical knowledge of the oil industry, Mr. Whitehouse divided the company into business groups and delegated most operating responsibility to the unit heads.

Explaining why the company's net income had dropped from $1.5 billion in 1984 to $308 million in 1985, Whitehouse stated that income had been reduced by $1.86 billion before tax ($1.15 billion after tax) in the fourth quarter of 1985. The charges against earnings reflected a reevaluation of assets, the cost of the continued shutdown of the Utah Copper Division during modernization, as well as expenses related to staff reductions (some 1,300 positions had been eliminated). 'In 1985, total operating income before special charges was almost equal to 1984, as the combination of higher sales volumes of Alaskan crude oil and significant gains in refining and marketing income balanced the effects of lower crude oil prices and higher exploration expenses,' reported Whitehouse and Miller.(6)

British Petroleum takes charge

With almost no warning, however, Standard Oil's parent company, British Petroleum decided to assert itself in the affairs of Whitehouse's company. Since BP had acquired a significant interest in the company in 1970, it had allowed Standard to operate independently of BP. Under the 1970 pact, BP had been limited initially to two, then to three members of Sohio's Board of Directors. By 1986, however, Sir Peter Walters, chief executive of British Petroleum Company and his top aides decided that BP's hands-off policy had to change. The precipitous drop in oil prices, coupled with Standard's $1.8 billion pretax write-off in 1985 of Kennecott and coal assets, triggered the action. 'There were a number of disappointments in the past few years,' said Sir Peter. 'Looking back at those, and the testing time ahead for oil prices, we felt we had to strengthen management for all shareholders' benefits.' (7) Informed by Sir Peter of BP's plan to take over managerial control of Standard Oil, Alton Whitehouse reluctantly resigned his position as CEO at Standard's February 27, 1986 meeting of its board of directors.

Robert B. Horton, an executive with British Petroleum and a Standard Oil board member, succeeded Whitehouse as chairman and chief executive officer of Standard Oil on April 1, 1986. Frank Mosier, Standard's executive vice-president, succeeded John Miller as president and chief operating officer. The functions of chief vice-president/chief financial officer and of executive vice-president for engineered products; chemicals, metallurgical products and technology were filled by BP executives John Browne and Colin Webster, respectively, brought to Cleveland from London. Described as a workaholic, CEO Horton had experience at turning around two problem BP units; a $2.8 billion chemical subsidiary and a tanker company. Concerned with Standard's failure to reinvest successfully the cash from Prudhoe Bay, Horton was faced with the prospect of recommending to the board either that Standard continue trying to replace Prudhoe Bay oil or that the company be shrunk. 'If I have somewhat of a reputation as a hatchet man, it's perhaps because I've never been reluctant to admit it when I made a mistake,' asserted Horton. 'It's really best at that point to cut your losses and move on.'(8)

The U.S. oil industry

1986 had been another difficult year for the U.S oil industry. United States oil demand of 16 million barrels a day was still far below peak demand of 19 million barrels a day in 1978. The 'spot' price for West Texas Intermediate, the barometer of U.S. oil prices, dropped from $30 per barrel in October 1985 to $10 per barrel in March 1986 and stayed below $18 for the rest of the year. Standard Oil's 1986 budget had been based on oil priced at $18 a barrel. The company's total cost of producing and transporting Alaskan crude oil to refineries ranged between $11 and $12 per barrel.(9) Other oil companies faced the same problem. An industry composite of the 29 largest fuel companies in the United States by *Business Week* revealed a 26% decline in dollar sales and a 24% decline in dollar profits in 1986 from 1985.(10) The National Petroleum Council estimated that approximately 150,000 jobs, roughly 25% of the total, were lost in the oil industry in 1986 as U.S. oil production dropped by 700,000 barrels a day, or about 6%, even though demand was rising nearly 3 percent. 'America's oil industry has been devastated by this price skid, and the devastation continues,' reported Fred Hartley, chairman of Unocal Corporation.(ll)

Problems with diversification

A number of the major integrated oil companies have found the industrywide problems to be aggravated by their experiences in diversifying outside the energy-related field. Standard Oil's poor experience with its Kennecott acquisition was paralleled by Mobil's problems with its cash-hungry Montgomery Ward subsidiary, Atlantic Richfield's difficulties with its Anaconda mining unit, Ashland Oil's unsuccessful move into insurance, and Exxon's string of bad investments. In particular, Exxon's purchase of Reliance Electric in 1979 for $1.2 billion had been selected by *Fortune* as one of the decade's seven worst mergers. The list of oil firms diversifying out of oil during the 1970s had become quite a long one by 1980. Nevertheless by 1986, most of these non-oil related acquisitions had been sold or were in the process of being sold as companies began to concentrate once again on the oil/energy business.

Threat of takeovers

Adding to the pressures facing the major oil firms in the 1980s was the increasing threat of being taken over by another firm. The acquisition of Conoco by DuPont, Cities Service by Occidental Petroleum, Getty Oil by Texaco, Superior Oil by Mobil, and Gulf Oil by Chevron (Standard Oil of California) shook the industry. In addition, Royal Dutch/Shell acquired the remainder of its 64.9% owned U.S. subsidiary after a lengthy stockholder law suit. Pennzoil's dissatisfaction with having lost Getty Oil to Texaco led to a successful law suit against the winner and to Texaco's surprising declaration of Chapter 11 bankruptcy in April 1987.

Also in early 1987, Amoco (Standard Oil of Indiana) outbid both Exxon (Standard Oil of New Jersey) and TransCanada Pipelines for Canada's Dome Petroleum. Canadian Energy Minister Marcel Masse was concerned with Amoco's purchase, given the Canadian government's commitment to its goal of increasing Canadian ownership in the oil and gas sector from its then current 48% level to 50%. The purchase of Dome by Amoco, the fifth largest U.S. oil company in terms of revenue, reduced Canadian ownership in the industry to about 40%.(12)

Forces leading to the intense merger activity included undervalued stock prices, high cash positions, and declining U.S. oil reserves. With growth in world demand for refined oil products projected at a rate of only 1 to 2% annually for the rest of the 1980s, stocks of the big oil firms were trading at substantial discounts to the value of the wealth they had amassed to date. The huge cash flows coming for the production and sales of oil and gas reserves were generally far larger than could be prudently spent on new drilling prospects. After noting the bad experiences of Mobil, Sohio, Ashland Oil, and Exxon, among others, in investing outside of the energy industry, and considering the depressed nature of coal and nuclear energy, almost all of the large firms had been raising their dividends and buying back their own stock. Purchasing one's own stock served several functions. Assets were acquired with excess cash at low risk without a takeover premium. By reducing stock outstanding, earnings per share was increased. The company's stock price was also supported.

With the average finding cost of around $12 per barrel, U.S. oil companies reduced their exploration spending by 40% in 1987 from 1986. Many U.S. oil operators insisted in April 1987 that they would not resume much domestic exploration until the price of oil increased from its current $18 per barrel to $25 per barrel.(13) (See Exhibit 1 for a summary of current reserves of representative companies.)

It therefore made sense for oil firms to supplement their exploration activities by buying other companies' reserves. Noting that the industry was not heavily concentrated by Federal Trade Commission and Justice Department standards, the U.S. Congress in March 1984 had rejected a proposed 11-month moratorium on further oil industry mergers. A green light was thus given to further merger activity for the foreseeable future.

Standard Oil's operations

The Standard Oil Company ended 1986 with a loss. In his first official letter in February 1987 to the shareholders and employees, Robert Horton reported:

> It was a terrible year; we reported a net loss of $345 million after special and extraordinary charges of $844 million net of tax. Even before these charges, our earnings fell some 66 percent to $499 million, largely because our average oil price was only $13.83 per barrel in 1986, compared with $26.43 per barrel in the previous year. And things would have been worse if our downstream oil and non-oil businesses had not generally put in good performances.(14)

(Financial and operational data for Standard Oil are presented in Exhibits 2 through 4.) Having spent a year of pruning the exploration portfolio, cutting capital expenditures, reducing overhead, selling off some businesses, and modernizing others, Horton next presented in the February 1987 letter his plan for surviving oil prices he felt would average only $15 per barrel:

Our strategy for Standard Oil has four simple rules:

- First and foremost, we are an oil company.
- Diversify in moderation only. Nonoil must fit, be competitive, and be profitable.
- Keep our financial position strong.
- Manage for profitability, not for size or growth for its own sake.(15)

BP's bid for Standard Oil

Only eight days after the British government had announced its intention to sell its remaining shares in British Petroleum, the top management of BP announced a 28-day tender offer to begin April 1, 1987 for the 45% of Standard Oil it did not already own. It offered to pay $70 for each of the approximately 105.8 million shares for a total of $7.4 billion. The bid was the largest ever by a British company and the largest in the United States since Chevron's $13.23 billion acquisition of Gulf in 1984. If it succeeded, the offer would make BP the third largest oil company in the world behind Exxon and Royal Dutch/Shell.

At a London news conference on March 26, Sir Peter Walters said that BP's management wanted to eliminate the minority holding to make expansion easier in the United States—'an important focal point of our future strategy.' In the past, Sir Peter added, BP had been hampered by a cumbersome dual board structure and potential competitive conflicts with Standard in planning U.S. opportunities. David Simon, chief financial managing director of BP, said that a combination of the two companies 'cleared the ground for' major acquisitions of oil reserves or downstream operations in the United States. 'Much of what BP can do, we feel it can do in the United States,' added Sir Peter Walters. Walters stressed that his goal in taking full ownership of Standard was not to make BP larger but to make it more efficient and profitable by focusing on low-cost production, Referring to past relations with Standard Oil, he pointed out that 'we were either missing tricks because our joint overheads were too high, or we were pursuing different paths.'(20) The last point was a reference to the tendency of Standard's previous CEO, Alton Whitehouse, to act independently of BP and to ignore the parent company's advise. For example, when Standard purchased a concession in 1985 to prospect for oil in Qatar, a Middle East state where BP had considerable exploration experience, BP's top managers first learned of the purchase when they read it in the newspapers.(21)

According to BP's David Simon, the company planned to fund about one-third of the stock purchase from its own cash with another third coming from commercial paper and the remainder from bank borrowings. 'We would intend to (repay the bank loans) from the joint cash flow of the combined companies,' stated Simon. Rodney Chase, BP group treasurer, said that BP's debt to total capital would increase from 33 to 44%, but would be back in the high 30s within a year of the purchase. The price for Standard's shares had been set at $70 based upon top management's assumption of an inflation-adjusted crude oil price of $18 a barrel through the end of the century. This was an increase over the $15 a barrel price for the same time period which both BP and Standard had used during 1986 for planning purposes, said Simon.(22)

Upon BP's announcement on March 26, the price of Standard Oil stock rose $6.50 on the New York Stock Exchange to $71.375 on a volume of 5.5 million shares. Just hours after BP's bid was announced, a class-action suit was filed in Cleveland on behalf of Standard's minority stockholders. The suit argued that BP was offering 'a fraudulently low and unfair price' for the stock. This action was reminiscent of Royal Dutch/Shell's attempt in 1985 to buy the remaining 30.5% of the U.S. Shell stock it didn't own. In that instance, the parent company's offer of $55 a share faced a similar class-action suit. Royal Dutch/Shell was forced to raise the bid twice to $60 a share because of protests from Shell's minority shareholders and outside directors. After much delay, the terms were finally approved in a Delaware court.(23)

In response to a question asking if BP might increase its offer, Sir Peter Walters uttered a flat 'no' and said that unlike Royal Dutch/Shell; BP wasn't proposing a merger. British Petroleum was simply buying Standard's stock in the open market and only had to follow full disclosure rules. Therefore, Standard's board did not need to place an independent valuation on the company. In addition, Sir Peter stated that under BP's interpretation of Ohio corporate law, British Petroleum could force minority shareholders to accept the $70 offer if BP's current 55% stake in Standard Oil reached 90%. The shareholders of British Petroleum were to vote on BP's action at a special April 22 meeting.

Standard Oil's response

British Petroleum had presented its plans to purchase Standard Oil's remaining stock at a special Standard Oil board meeting on March 9, 1987. The special committee of outside directors established to monitor Standard-BP relations gave BP a guarded response. The committee's chairman, Douglas Danforth, asked Sir Peter to postpone the offer for one or two months to give the committee adequate time to review the offer. BP replied negatively. The committee hired First Boston Corporation to examine the offer. In an April 3 letter to the committee, First Boston contended that BP's offer did not include a premium over Standard's current stock market price since Standard's stock would have been trading at $70 even without BP's bid. It concluded that Standard Oil stock was worth at least $85 a share. After first announcing that it would issue a statement on BP's offer on April 14, the special committee of outside board members decided to postpone its recommendation until April 23.

The committee did, however, ask shareholders to wait until the committee made its report to Standard's board before tendering their shares to BP. The tender offer was due to expire on April 28, unless it was extended by BP.

The wide gap between First Boston's valuation of Standard Oil and that of Goldman, Sachs, & Company, which had prepared the BP offer, created a war of words between the two investment banking firms. In addition to differences on the amount of probable reserves in Prudhoe Bay and on the future operating income of Standard's refining and marketing business, the two valuations differed on the future price of oil. BP's offer was based on a forecasted 1988 price of $18 per barrel for West Texas Intermediate crude oil adjusted for an expected 5% annual rate of inflation through the end of the century. First Boston, in contrast, took into account three possible oil-price scenarios, ranging from a starting price of $17.25 a barrel with modest price escalation to $20 a barrel with rapid escalation.(24) British Petroleum labeled First Boston's calculations 'ill-founded' and 'seriously flawed.'

The eight inside directors of Standard Oil were in a rather difficult position. The three representatives of BP on the board obviously had to support BP's offer. The three top executives of Standard Oil who had been placed there by BP were caught between the two sides. In Horton's case, as an ex-managing director of British Petroleum and a likely candidate to run BP some day, anything the chairman of Standard Oil did was bound to provoke criticism. Directors Mosier and Bray had no past connections with BP, but obviously depended on Horton and BP executives for their future with Standard Oil. The level of discussions which look place during April between the committee of seven outside directors and top management of British Petroleum suggested that the outside directors were not willing to go along with BP's $70 per share.

What should the board recommend to the minority stockholders of Standard Oil? A failure by BP to obtain the stock or a drawn-out legal battle could hurt the British government's plan to sell its 32% stake in BP in the fall of 1987. Given that one of the members of BP's 13-member board of directors was appointed by the British government this was no small concern to BP's top management. This situation worked to the benefit of Standard's special board committee as it deliberated on what to recommend.

The future price of oil

Every oil company and industry analyst appeared to have a different estimate of the future price of oil. Many believed that the price was bound to increase significantly. Exxon, for example, assumed in 1987 that the price of oil would stay flat in constant dollar terms for a few years and then rise faster than the rate of inflation. In a speech delivered to the Australian Petroleum Exploration Association on March 22, 1987, Donald McIvor, an Exxon senior vice president, said that 'the price of oil must rise significantly again before too long.' He noted that the world had been using oil at rates of 20 to 25 billion barrels a year since 1970, while discoveries had been accumulating at only 10 to 15 billion barrels a year. 'Most major consuming countries, including those with substantial production of their own, will ultimately come to depend heavily on Middle East oil.'(25) In general agreement with this view, the U.S. Department of

Energy forecast a $33 a barrel price in constant dollars by the year 2000. Data Resources, Inc., an economic forecaster, estimated a $32 constant dollar price ($64 with likely inflation) by the end of the century.

A case could be made, however, for a reasonably constant oil price. For example, Arlon Tussing, an energy economist, predicted that oil prices in constant dollars were 'likely to remain within a range of $10 a barrel and $20 a barrel for the rest of this century.' As for the longer term, he expected technology to push energy prices not up but down. Tussing argued that increases in the price of oil would cause large switches to natural gas and coal as substitutes. Unlike the situation in the early 1970s, oil was 'no longer the indispensable fuel,' said Tussing. For example, many industrial energy users in 1987 were equipped with dual or triple fuel capacity and could choose oil, gas, or coal, depending on the price. At prices much above $20, Tussing said, oil loses almost the entire global bulk-fuels market to other energy sources (26)

A report issued in February 1987 by the National Petroleum Council proposed two possible trends for future oil prices. One trend began at $18 per barrel in 1986 with growth at a constant dollar rate of 5% per year to $36 in the year 2000. The second trend started at $12 per barrel in 1986 and grew at a constant dollar rate of 4% per year to $21 by the year 2000. The report also warned that the percentage of U.S. consumption that came from imports could increase from 33% in 1986 to 48% by 1990 if crude oil prices remained near 1986 levels and could even rise to 66% of consumption by the end of the century. The report further warned that the United States could face a return to the oil crises of the 1970s, when political problems in the Mideast combined with high American dependence on imported oil to create shortages.(27)

These varying estimates regarding the future price of oil were reflected in the different valuations of Standard Oil by Goldman, Sachs and Company (BP's financial adviser) and First Boston Corporation (financial adviser to the special board committee of Standard Oil). According to Goldman, Sachs and Company, a $1 change in the per barrel price of oil had the effect of changing the value of Standard Oil's proved oil and gas reserves by an amount equivalent to approximately $4 per share of common stock.(28)

Questions

1 If you were a member of the special committee of Standard Oil board members, what use would you make of the following microeconomic concepts: (a) demand curve, (b) supply curve, (c) price elasticity of demand, (d) income elasticity of demand, and (e) cross elasticity of demand?

2 Evaluate Donald McIvor's forecasts of the price of oil. Do you agree with his reasoning? Why or why not? Has he been correct thus far?

3 Evaluate Arlon Tussing's forecasts of the price of oil. Do you agree with his reasoning? Why or why not? Has he been correct thus far?

4 Suppose that the market demand for oil is such that $QD = 22 - 0.1P$, where QD is the quantity demanded of oil (in billions of barrels) and P is the price of oil (in dollars per barrel). Is this in accord with Mr. Tussing's argument? Why or why not?

5 In 1981, Standard Oil bought Kennecott Copper. During the late 1970s, there was a decrease in the rate of growth of electricity generation in many countries, and during the 1980s aluminum and fiber optics became more important as a substitute for copper. Did these events tend to shift the demand curve for copper? If so, in what direction?

6 The price of copper fell from about $1 per pound in 1980 to about 60 cents in 1986. Is this consistent with your answer to the previous question? Why or why not?

7 If you had been a member of Standard Oil's board in 1985, would you have recommended that it sell Kennecott? Why or why not?

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15. Ibid.

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Source: Mansfield, E., *Study Guide and Case Book for Applied Microeconomics*, Norton & Co., New York, 1994, pp. 72–8, 82–7.

Why some buyers are less price sensitive than others

Reading 3.2

Michael E. Poner

Buyers of products differ greatly in the degree to which they are sensitive to price changes. The demand curves of some buyers may be very elastic while other buyers may have very inelastic demands. Where buyers are insensitive to price and to price changes, one or more of the following conditions tend to prevail:

1. *The buyer is very concerned about product performance.* Buyer demand tends to be price inelastic whenever a product that 'fails' or does not perform up to expectations causes the buyer to incur substantial penalties, costs, or inconvenience. The adverse risks of product failure make it worth while for buyers to pay a premium price for high performance characteristics and inclines them to stick with products and brands that have proven reliable in the past. A good example where this happens is in the oil-field-equipment industry. The demand for blow out preventors (a piece of oil field equipment that prevents oil from escaping a well if there is a surge in pressure) tends to be price inelastic; if the blowout preventor fails, the user faces considerable costs in terms of lost oil, lost time of skilled crews, and environmental sanctions, particularly in the case of offshore wells, where the clean up of spills is particularly expensive. As a consequence, buyers of blowout preventors are reluctant to switch from proven brand names even in the face of price increases and even when other companies seeking to penetrate the market offer lower-priced products with allegedly comparable performance features.

2. *The buyer wants a differentiated or custom-designed product and is willing to pay extra for it.* Whenever buyers want a specially designed product to fit their own particular needs, they often become locked into purchasing from a particular supplier who is willing to go to the trouble to satisfy the buyer's special design requests. In such instances, buyers may conclude that extra effort on the part of the supplier merits the compensation of a higher price. Of course, later, the supplier's willingness to accommodate the buyer's wants may provide the leverage needed to impose a price increase without much risk of losing the buyer's business.

3. *The buyer purchases the product because it is perceived to contribute to the high-quality image the buyer is trying to project on behalf of its own product.* Buyers of items that are components of the buyer's own final product often have price inelastic demands because they

perceive that the item's quality will enhance the performance of their product, or because the brand name of the component carries prestige value which reinforces the high-quality image they are trying to project. For example, the manufacturers of expensive pieces of equipment will often use the electric motors of prestige suppliers as a component part because doing so upgrades the image of their machinery and helps enhance its market attractiveness. Manufacturers of the component part, knowing of the benefit their component gives the final product, are then in a position to ask for and get a slightly higher price when other firms cannot.

4. *The buyer obtains major savings from using a particular product or service.* Whenever a product or service can save a buyer time and money because it performs well, the buyer will tend to have an inelastic demand for the product. The same holds true when a buyer can benefit from timely delivery of a product, rapid maintenance and repair in the event of breakdowns, and technical advice. To cite an example, when a firm has high stakes in the outcome of a particular situation (such as an electric utility filing for a $200 million rate increase), the firm will be willing to pay a premium for the very best advice it can get from lawyers, accountants, consultants, and other experts having specialized knowledge and talents to offer. Another example, drawn again from the oil industry, is where a company such as Schlumberger uses sophisticated electronic techniques to detect the likely presence of oil in substrata rock formations; the information obtained from such instruments has the potential for steering oil-drilling companies away from locations where there is greater probability of a dry hole. Understandably, then, oil-drilling companies are willing to pay substantial fees for Schlumberger's services, particularly when they face difficult and costly drilling expenses because of great depth or offshore location.

5. *The cost of the item is small compared to the buyer's purchasing budget.* Many consumers do not bother to shop around for the best price and to undertake time consuming product comparisons when the cost of the item is low. This is especially true when the buyer's major motive in purchasing the item is convenience, taste, or some other subjective preference criterion. In the case of industrial buyers, the relevant cost of an item is the firm's total expenditure for the item over some time period (a month or a year), not the cost per unit. Low unit cost is not a sufficient consideration because the number of units purchased may make the dollar costs of the item very important. In industrial purchasing, the purchase of component parts or raw materials that entail a high total dollar cost is usually handled by top executives and/or senior specialist purchasing agents who may well be very price conscious—thereby creating an elastic-demand situation.

6. *The buyer is in a position to absorb a price increase and/or can readily pass on higher costs of component parts and raw materials.* As a rule, the more a firm is in position to pass along rising costs, the less tenacious and aggressive it will be in haggling over prices and price increases. The same can hold true when an industrial buyer has a sufficiently high profit margin that it is willing to absorb a price increase rather than go to the trouble of seeking out alternative sources of supply.

(However, in such circumstances the item is probably a sufficiently low cost item that the basic reason for price insensitivity is that the buyer falls into category 5.)

7. *The buyer is poorly informed and/or does not adhere to a policy of purchasing according to well-defined specifications.* Buyers tend to be less sensitive to prices and price increases when they are poorly informed about prevailing price conditions, demand-supply conditions, the availability and prices of substitutes, and the performance-quality-service features offered by rival brands and suppliers. More-informed buyers tend to be hard bargainers on price and other conditions of purchase. Indeed, many large purchasers make a special effort to learn the business of their suppliers so well that they know when they are getting a good price and when they are not. A poorly informed buyer is easily swayed by persuasive advertising, a good sales pitch, and efforts to downplay the performance differences among competing products.

8. *The cost to a buyer of switching from one seller to another is very high.* In some cases, an industrial user of a component part may tie the specifications of its products to that of a particular supplier, or the firm may make heavy investments in installing and using a particular supplier's equipment (as is often the case with a computer). When buyers' switching costs are high, they may well be insensitive to price changes—especially small price changes that would not make it worthwhile to switch.

Source: Thompson, A.A. Jr & Formby, J.P., *Economics of the Firm: Theory and Practice,* 6th edn, Prentice Hall, Englewood Cliffs, New Jersey, 1993, pp. 128–9.

Macroeconomics: Issues, goals and measurement

Topic 4

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Introduction

As indicated in Topic 1, business managers need to be aware of the general economic environment in which they are operating in order to make sound business decisions. In forecasting demand, producers must estimate how fast consumers' incomes will grow; in estimating costs, producers must take into account the level of wages (determined in the labour market), interest rates (determined in the capital market) and the general level of input prices (determined in the goods and services market). Some of these prices and incomes can be manipulated by government macroeconomic policy. Business decision makers need to have some understanding of the economic principles which form the basis of economic policy in order to be able to predict likely policy directions and determine what impact any policy changes may have on key economic variables.

In this topic you will be introduced to the basic concepts of macroeconomics and shown how to undertake aggregate measurement. We will highlight the key questions in macroeconomics: the problems of unemployment and inflation, and the issue of a sustainable rate of economic growth.

Objectives

At the completion of this topic you should be able to:

- outline the fundamental concepts of macroeconomics;
- cite macroeconomic questions and related policy issues;
- define the main macroeconomic objectives and associated performance indicators;
- explain the circular flow model and its basic identity;
- measure and assess aggregate economic activity using various descriptive statistics; and
- provide a brief picture of recent Australian economic activity.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 2, 20, 27, 28 (parts thereof).

Readings

Reading 4.1
R. Waud et al.
'Policy perspective: Social welfare and GDP'

Reading 4.2
Economic Roundup
'World economic outlook'

Overview of macroeconomics

The next three topics in this unit will be devoted to macroeconomics, i.e. the study of the economy and its interactions as a whole. To appreciate the importance of macroeconomics, you need only read the newspaper or listen to the television or radio news. The media report macroeconomic developments daily. It might be news about unemployment rates, or inflation, or concern about possible changes in interest rates, taxation rates and government spending programs. It might be debate about whether the economy is coming out of recession or is reaching the peak of a boom. The following headlines are commonplace in the print media:

> RESERVE GETS TOUGH
>
> CONFIDENCE IN ECONOMY LOWEST FOR THREE YEARS
>
> BUDGET FORECASTS START TO LOOK SHAKY
>
> CAR TARIFF CUTS WILL COST 60,000 JOBS: UNION
>
> STOCK MARKET BOOM TO CONTINUE

We need to understand how the macro-economy works so that we are able to predict what government is likely to do given certain economic conditions, and to appreciate the likely impact of particular policies.

A distinction can be made between *microeconomics*, which analyses the behaviour of the individual units which make up the economy, and *macroeconomics,* which studies the functioning of the economy as a whole. However, these economic perspectives are just two ways of looking at the same thing. The behaviour of the economy as a whole is dependent on the behaviour of the units that make it up. For example, the overall unemployment rate is, in part, the result of the employment decisions of all the firms, and the work/leisure choices made by individuals. The inflation rate is, to a large extent, the result of the price/output decisions made by all the firms, and government policy. The rate of economic growth is determined by countless decisions, by all economic agents, about investment, research and development, and new products.

☐ *Read the introduction to Chapter 20 in Begg et al. (2000), pp. 329–30.*

Question 4.1

For each of the following statements, indicate whether the issue is one of microeconomics or macroeconomics.

(a) The decline in the world price of beef.

(b) The effect of the government budget on inflation.

(c) The wool surplus.

(d) The high rate of economic growth in South East Asian economies.

(e) Wage increases in the car industry due to improved productivity.

(f) High interest rates.

(Check your answers at the end of this topic.)

Fundamental concepts

Macroeconomics is concerned with the functioning of the economy as a whole. We identify national economic aggregates (totals) such as national output, employment and inflation, and try to explain what determines the total output of goods and services produced, the level of employment and the rate of change in the general price level over a certain period. We do this by studying what causes changes in the demand and supply curves in the labour, product, and capital markets, and by looking at the interactions between the four sectors of the economy—households, business firms, government, overseas—in those markets. We also ask why the level of output tends to fluctuate over time.

The total value of the level of economic activity during a particular period of time can be measured in one of three ways: aggregate expenditure, aggregate income, or the total value of output in all industries. These three measures represent three different ways of measuring the same thing: the level of economic activity over a certain period.

In measuring the state of the economy, we look at a host of economic variables, that is, such items as the components of expenditure and income, the accumulation of capital stock, the level of employment, the number of hours worked, the money supply, to name just a few. This data can then be interpreted and factors determining rates of change identified.

Observations of particular economic variables form the basis of our analysis and official economic statistics are crucial. They provide a systematic and objective source of information, and the current state of the economy can be determined by interpreting the statistics.

In quantifying economic variables, economists distinguish between stocks and flows. A *stock* is a quantity measured at a given point in time, such as the quantity of money or the amount of capital stock in the economy at the end of the financial year. A *flow* is measured per unit of time, such as the amount of income earned or the amount of spending undertaken per year. We also distinguish between exogenous and endogenous variables. The variables whose values are explained by a particular theory or model are referred to as *endogenous* variables. The variables whose values are determined outside the model and whose values are not affected by changes in endogenous variables are referred to as *exogenous* variables.

Macroeconomic questions and policy issues

The subject matter of macroeconomics is about developing an understanding of economy-wide problems. Economists and governments around the world are constantly looking for policy combinations that will deliver sustainable economic growth, low unemployment and low inflation.

Questions

In macroeconomics we ask: 'How can the economy work more efficiently, more equitably and with less instability'? Macroeconomic *theory* is concerned with explaining what determines the level of employment and output as well as the rate of inflation and the overall growth rate of the economy.

Economic objectives are set and the performance of the economy judged against certain criteria. The critical issues for debate are: full employment, price stability and economic growth.

- Does full employment mean a 2% unemployment rate or a 6% unemployment rate?
- By price stability do we mean zero inflation or inflation under 3% per annum?
- Can we determine an acceptable rate of economic growth?
- Why do some economies appear to thrive, whilst other economies stagnate?
- Does it matter that governments run budget deficits?

These questions are the subject matter of macroeconomics and in this topic we will address these economy-wide issues.

Question 4.2

Consider the following statements about key economic issues. There is much disagreement among macroeconomists about such issues. These disagreements arise from differing value judgements, or from different beliefs about how the world works. Do you intuitively agree or disagree with these statements?

(a) Inflation is necessarily a bad thing.

(b) More economic growth is definitely desirable.

(c) Full employment occurs when everyone has a job.

(d) The government budget should always be balanced.

Policy

Macroeconomic policy is about what government can do to address economy-wide issues such as unemployment, inflation and fluctuations in the level of economic activity. It can be divided into fiscal (budgetary) policy and monetary policy.

- *Monetary policy* variables are those controlled by the Reserve Bank of Australia that directly affect the rate of change in the money supply.
- *Fiscal policy* variables are any of a number of activities undertaken by government that affect total spending either directly (through government purchases) or indirectly (through taxes and income transfers to individuals).

The success of any macroeconomic theory depends on its ability to explain why business cycle fluctuations occur and what policymakers can do to smooth them out. If the government is to intervene, how should it do so? Various policy 'instruments' can be used to bring about certain outcomes. Some instruments simultaneously affect many different aspects of the economy, so choosing the best set of policy instruments is an important task for policymakers.

Economic theory and analysis can sometimes tell policymakers what they should do, but sometimes it cannot. We are often forced to choose between alternatives that have different consequences for different people (that is, a trade-off) and this involves making value judgements about the likely consequences of particular policies. Generally, most members of the community believe that government is responsible for maintaining the economy at full employment, with stable prices, and for creating a sound economic environment in which business can operate.

Empirical research (research based on observation and experiment) in economics does not always provide clear-cut answers. Empirical economists do the best they can and in some cases their research is very convincing and their results widely accepted. In order to understand the key ideas and relationships in macroeconomics, we will now build up a simplified model of how we believe the economy works. You shall then be in a position to discuss some of important policy issues that confront business decision makers all the time, and impact heavily on the environment in which business has to operate.

Theoretical framework

Economists use the techniques of observation, analysis and statistical inference to unravel the bewildering complexity of the modern economy. Understanding comes by simplifying from the vast amount of data issued by governments and businesses. We set up a formal framework for representing the basic features of a complex system by a few central relationships. This framework will help us to answer the questions raised in the previous section.

Macroeconomic models

Economists use scientific methodology to develop simplified models of the economy which try to explain complex reality. An economic model is merely the way in which we organise our thinking about a particular problem. Models may be a series of statements, working diagrams, graphs or equations. Model building involves the use of assumptions, the identification of functional relationships, the construction of equations using exogenous and endogenous variables, and the application of logic.

The model enables us to analyse economic behaviour and to understand the impact of changes in policy instruments on economic objectives.

☐ *Read sections 2-9 and 2-10 in Begg et al. (2000), pp. 26–7.*

You have already been introduced to economic models in topics 1 and 2 (production possibility diagram, demand and supply graphs—from what we have said above, why are these models?). We now look at the basic model used in macroeconomics.

The circular flow model

The *circular flow model* (or diagram) shows how resources, production and income flows are linked together in an economy. The key concept of the circular flow model is that the total market value of goods produced in an economy will always be equal to the total income generated from the production of those goods, which in turn will always be equal to the total amount spent on those goods. There is thus a circular flow of payments (and resources).

☐ *Read Section 20-3 in Begg et al. (2000), pp. 332–3.*

Assumptions

The assumptions which underly the simple circular flow model are listed below. It should be noted that all of the following assumptions can be relaxed, and the fundamental identity of the circular flow model will not be changed (but more of that later). The assumptions are:

1. All income received by consumers is spent (no saving).
2. Businesses do not purchase capital goods (no business investment).
3. There are no financial markets (no borrowing or lending).
4. There is no government economy (no taxes or government spending).
5. The economy is closed (no imports or exports).

☐ *Refer to Figure 20-2 in Begg et al. (2000), p. 332.*

The lower, left to right, loop of this diagram shows the flow of economic resources (land, labour and financial capital) owned by households to business firms. These resources are usually referred to as *factors of production*. In exchange for these factor services, businesses make money payments in the form of wages, rents, interest and the distribution of profits, that households receive as *incomes* (lower, right to left, loop). These money payments represent business demand for factors of production, and the source of income for households. The amounts received are determined in the markets for production inputs.

The upper loops represent the flow of *goods and services* produced by businesses using all the inputs provided, and supplied to households. The goods and services are demanded by households and purchased with the income they received when they contributed their factor services. This money flow represents *household spending*. The prices for the goods and services are determined in the product markets.

In this money-using, pure market economy, there is a *clockwise* flow of money payments which is the demand for the *anticlockwise* flow of resources, goods and services. These simultaneous flows reflect the interactions between buyers and sellers in the many markets of the economy. The diagram in Figure 20.2 enables us to keep track of these interactions but it is too simple. We now relax some of the assumptions and develop a more complete model.

Relaxing assumptions 1, 2 and 3

If the assumptions that households do not save and businesses do not invest is relaxed, and we include financial markets, the validity of the circular flow diagram is still upheld. In this simple model (since there are no taxes), *saving* is the amount of income not spent by households on consumption. *Investment* refers to the purchase of new capital goods (e.g. equipment, plant and machinery, buildings) by firms. Financial markets channel household saving to the firms that wish to borrow to invest in new capital goods.

To illustrate that the fundamental identity of the circular flow diagram still holds, we start by assuming a particular value of output produced, say $500 million. If households only spend $400 million on consumer goods, the amount not spent on consumption (i.e. saving) is $100 million. For firms, the value of output produced was $500 million but the amount sold to households was only $400 million. Part of current output produced during this income period was not sold. The amount set aside, to be used in the future, is $100 million. Increases in business inventories of this sort always qualify as a form of investment. Firms spend $100 million on the production of goods (in the form of money payments to the owners of the factors involved in the production of goods) that consumers did not purchase during the current period. Therefore, total spending on goods and services is equal to the amount spent on consumption (consumer durable and non-durable goods and services) and the amount spent on the investment in inventories. Read the following section of the text for further elaboration of this principle.

☐ *Read 'Investment and saving' in Begg et al. (2000), pp. 326–8.*

As you can see, we can summarise the relationship as follows:

Let: Y = value of output produced and income.

By definition, income and the value of output produced are always equal.

C = consumption

S = saving

I = investment

By definition, the value of output produced (Y) always equals expenditures (the sum of C and I)

$$Y = C + I \text{ (Expenditures)} \qquad (4.1)$$

By definition, income is either spent, or saved.

$$Y = C + S \text{ (Income)} \qquad (4.2)$$

In the circular flow diagram with saving and investment it can be shown that income always equals expenditures:

$$C + S = C + I \qquad (4.3)$$

[N.B. There is a typographical error on p. 336 of Begg et al. (2000). The equation should read $Y = C + S = C + I$.]

This analysis is based on the fact that the household sector and the firm sector interact through the product market, the financial market and the factor market. Households provide land, labour and capital to the firm sector and in return receive income in the form of rent, wages and salaries, interest or profits. This interaction occurs in the market for factors of production. Firms produce goods and services and households spend their income to purchase those goods and services. This interaction takes place in the product market. Both households and firms save, and these funds are channelled into investment via the financial market.

Relaxing assumption 4

If we now bring in the government sector we must allow for expenditures to be increased by the addition of government spending on physical goods and services plus spending on the wages of civil servants, and investment programs in roads and hospitals. In addition, governments raise revenue by levying direct taxes on incomes, and indirect taxes on expenditures. These represent leakages from the income/expenditure stream similar to savings (taxation is often referred to as forced saving).

$$C + S + T = C + I + G \qquad (4.4)$$

☐ *Read 'The Government' in Begg et al. (2000), pp. 337–9.*

Relaxing assumption 5

Moving even closer to reality, the assumption of a closed economy can be relaxed. Adding to expenditures the amount spent on net exports (the difference between exports and imports) gives:

$$C + S + T = C + I + G + EX - IM \qquad (4.5)$$

Imports are subtracted from spending because they are already included in consumption, investment and government spending estimates. Equation (4.5) should be read as ex post (i.e. actual) income, made up of that part of income set aside for consumption, plus that part not spent because of saving, plus that part not spent because of taxes. This will always equal the sum of ex post (i.e. actual) spending on consumption and investment plus government purchases and net exports.

☐ *Read 'The foreign sector' in Begg et al. (2000), p. 339.*

Question 4.3

In a hypothetical closed economy with no government, planned consumption is 150, planned investment is 50, total production is 210.

(a) How much is total planned expenditure?

(b) Calculate unplanned stock changes.

(c) How much is savings in this situation?

(d) What is actual investment?

(e) How would you expect producers to react to this situation in the next period?

This analysis of the way in which an economy works concentrates on the interaction of the broad sectors within the economy. We shall now develop a system of national income accounting to enable us to assess the performance of the economy in much the same way as the accounts of a company provide a picture of how the company is doing. We measure Gross Domestic Product, Gross National Product, and Net National Product—they are the key aggregate measures of the economy, i.e. measures of the total income of everyone in the economy and the total expenditure on the economy's output of goods and services.

Aggregate measurement

In this section we cover aggregate measures of economic performance—GDP and so on. In addition, we look at other aggregate measures related to the health of the economy—inflation and unemployment.

National product and income

From the fundamental identity of the circular flow diagram, we showed that the value of output produced by an economy could be found by measuring the total expenditure on that output, or the total income generated from the production of that output. Both measures will yield identical values. The level of economic activity for an economy is measured using either of these techniques.

Income approach	Add together all of the income generated from the production process that flows to the factors of production in a period. This sum will, by definition, be equal to the total value of output produced.
Expenditure approach	Add the value of all final goods and services produced in the economy during the year by totalling the actual dollar expenditure for these goods and services.

Gross domestic product (GDP) is the total market value of all final goods and services produced by the economy within a given year. Including only final goods (goods that are not resold) avoids the problem of double counting intermediate goods. For example, we cannot count the tyres on a new automobile as separate goods (output of the tyre factory), because we would be counting the tyres twice. When we count the value of the automobile (the final good) at its market price, we are including the value of all the intermediate goods used in its production.

☐ *Read 'Measuring GDP' in Begg et al. (2000), pp. 333–5.*

GDP measures the output produced by factors of production located in the domestic economy regardless of who owns these factors. If we want to know the value of output/income produced by Australian residents we calculate *gross national product (GNP).* This is equal to GDP *plus* income earned in foreign countries by the economy's citizens (Australian residents) *minus* income earned in the economy (Australia) by foreigners.

Capital goods wear out and get 'used up' during the course of producing other goods—they are subject to depreciation. Machines, tools and equipment need to be repaired or replaced. Factories and buildings require maintenance. Part of gross private investment goes towards these replacement activities simply to maintain the economy's existing stock of capital. Any addition to the economy's capital stock is called *net private investment. Net national product (NNP)* takes this depreciation into account It is equal to GNP *minus* an allowance for the deterioration of capital goods caused by producing that year's output (*depreciation or capital consumption*).

i.e. NNP = GNP − depreciation

Other important measures are *national income* and *personal disposable income.* National income is the income received by a country's residents. It is calculated by subtracting net income paid overseas from domestic factor incomes and then adding indirect taxes less subsidies. Personal disposable income is the amount of income available to households for consumption spending and saving. It is found by making adjustments to National Income to allow for net income paid overseas, direct and indirect taxation, and transfer payments.

Aggregate data for the Australian economy is shown in Table 4.1.

Table 4.1: Gross domestic product—Output, production and income

($ million, sa)

Average 1989/90 prices

	GDP(A)			GDP(P)				GDP(I)	Real gross domestic income	Gross national product	GDP(A) per capita $
	Farm	Non-farm	Total	Primary	Production and distribution	Other (mainly services)	Total				
1986/87	13 196	313 080	326 276	26 691	156 432	136 340	319 464	329 316	317 646	318 849	20 209
1987/88	12 541	330 823	343 364	27 760	166 236	145 012	339 005	345 456	338 960	333 881	20 932
1988/89	12 502	344 808	357 310	28 252	178 017	151 478	357 742	359 179	359 479	344 825	21 412
1989/90	13 664	355 408	369 073	30 556	180 760	158 727	370 043	370 043	370 026	352 644	21 786
1990/91	14 637	353 128	367 766	32 284	174 792	162 445	369 528	367 754	364 220	350 860	21 405
1991/92	13 808	356 421	370 230	31 772	172 537	164 879	369 189	368 865	363 189	354 455	21 285
1992/93	14 630	368 194	382 824	32 774	175 480	173 131	381 387	380 903	372 576	368 714	21 777
1993/94	15 032	385 769	400 801	33 367	185 463	180 903	399 732	399 842	389 332	387 193	22 552
1994/95	11 782	406 300	418 081	30 889	197 544	189 284	417 714	419 248	411 589	404 521	23 280
1995/96	14 750	418 978	433 728	34 691	202 853	195 910	433 454	434 201	430 002	419 137	23 840
1996/97	16 973	427 135	444 108	37 461	206 589	200 688	444 740	446 082	447 439	429 769	24 186

Source: Reserve Bank of Australia (1997), p. S118.

An ability to understand and interpret these statistics is of considerable benefit to business decision makers. They indicate the current state of the economy and therefore give some idea of where the economy might be heading in the foreseeable future. Is the economy in a growth phase or is it in recession? Such an assessment can be made after careful inspection of the national accounts. Is one particular sector experiencing difficulties? What are the prospects for the future, given activity in other sectors? Have there been any changes in the relative importance of the various sectors of the economy? These and other important questions can be addressed by analysing the national accounts.

Question 4.4

How would the following expenditures affect the level of GDP calculated using the expenditure approach?

(a) The purchase of commodities carried over from last year's inventories.

(b) The purchase of government bonds by an individual which resulted in $100 being earned as interest during the current year.

(c) A supermarket chain paying $8,000 to import kiwi fruit and selling them for $10,000.

Question 4.5

Which of the following items are included in the calculation of GDP in Australia and which are excluded?

(a) Salaries paid to schoolteachers.

(b) Tips given to taxi drivers.

(c) Expenditure on social security benefits.

(d) The income of a second-hand car salesman.

(e) Work carried out in the home by a houseperson.

(f) Work carried out in the home by a paid domestic.

(g) The value of pleasure from leisure.

(h) Free-range eggs sold in the market.

(i) Blackberries picked in the countryside.

Inflation

Inflation is commonly regarded as a national problem. Most people consider inflation to be bad because they believe it reduces the purchasing power of wages, and they blame inflation for any change in relative prices. This is not necessarily true. During a period of inflation, wages tend to rise more or less in step with prices. Also, relative prices change whether or not there is general inflation. The changes are a result of adjustments in product and factor markets, on either the demand side or the supply side of those markets.

There are two main types of inflation: demand-pull inflation and cost-push inflation.

- *Demand-pull inflation* arises due to excess demand as a result of increases in the money supply, increased government expenditure or rising prices in the rest of the world. This may lead to increased employment due to a shortage of labour and a wage-price spiral ensues.
- *Cost-push inflation* is a result of increasing wage rates or increases in the prices of key raw materials.

There are very real costs associated with inflation, particularly if it is unanticipated. Some groups are hit very hard by rising prices (e.g. fixed income earners, lenders), and the structure of the income tax system is such that inflation is not taken into account sufficiently (e.g. tax brackets are not indexed). Even anticipated inflation is a problem because, with money losing value quickly, people do not want to hold money and this can lead to speculation and the misallocation of resources. A high and variable inflation rate causes resources to be diverted from productive activities to forecasting inflation.

There is a subtle distinction to be made between a one time increase in the general level of prices (such as an oil price shock) and the process of inflation. A one time shock generally means that there was an important change in the relative prices of goods and services of the economy. Once this relative price adjustment has worked its way through the economy, however, there is no further pressure for prices to increase. This situation is in contrast to the more stubborn type of inflation which is defined as a sustained upward movement in the general level of prices. This general price level is measured by a price index and the inflation rate is the percentage change in the price level over a given period.

The formula for the annual inflation rate is:

$$\text{Inflation rate} = \frac{\text{current year's price level} - \text{last year's price level}}{\text{last year's price level}} \times 100$$

The most common measure of the inflation rate in Australia is the *consumer price index (CPI).* It is published quarterly and is based on the prices of thousands of products in eight broad categories. Each category of expenditure is weighted according to its relative importance in the consumption expenditure of a typical household. There is considerable measurement error with the CPI. The relative weights are not changed from year to year, and there is no adjustment for changed quality of products.

No single price index can represent precisely the change in the cost of living for everyone. But consumption expenditure is only one component of GDP. We need to use an index that reflects what is happening to the prices of all goods and services. The GDP deflator is a better measure of economy wide inflation because it includes the price of every good and service in the economy. The GDP deflator will be explained more fully in a following subsection of this topic ('Real versus nominal measures of economic activity').

The following table shows the CPI and the GDP deflator for the Australian economy from 1987–97.

Table 4.2: CPI and GDP deflator: 1986–96

June	CPI 1989–90 base year	GDP Deflator 1989–90 base year
1987	82.6	83.1
1988	88.5	89.5
1989	95.2	97.0
1990	102.5	102.1
1991	106.0	103.5
1992	107.3	105.4
1993	109.3	107.0
1994	111.2	107.7
1995	116.2	111.0
1996	119.8	113.7
1997	120.2	115.5

Source: Reserve Bank of Australia (1997), tables G.2 and G.3.

In interpreting these figures you need to realise that an index always has a base year. In this case it is 1989–90. The price index is a ratio of current prices to prices in the base year. The rate of inflation is the difference in the price index between two years expressed as a percentage of the first year. For example, the inflation rate for the 12 months to June 1996 (measured by the GDP deflator) is 2.4% (113.7 – 111.0 / 111.0 x 100).

Question 4.6

Does a 5% increase in the CPI mean that the cost of living has increased by 5%? Why or why not?

Question 4.7

If you anticipate inflation will rise over the next two years to 10%, what difference will that make to the way in which you allocate your resources? (Hint: think of labour input, capital stock, and monetary resources.)

Unemployment

Economics is about the efficient allocation of resources, and workers are a major resource. Keeping workers employed is an important concern for policymakers. The unemployment rate measures the percentage of those people who would like to work but do not have jobs. Unemployment is measured every month in Australia as part of a labour force survey of 30,000 households. A person qualifies as unemployed if he or she is at least 15 years of age but less than 65, is not currently employed, is available for work, and is actively seeking a job. This is not a measure of only those involuntarily unemployed. Some people may choose not to work for the prevailing wage rate, but may be seeking employment at higher wages.

The *labour force* is defined as the total number of people who do have jobs (the employed) plus the total number of people who are looking for a job, but do not have one—the unemployed.

Labour force = number of employed + number of unemployed

The *unemployment rate* is the percentage of the labour force that is unemployed.

$$\text{Unemployment rate} = \frac{\text{number of unemployed}}{\text{labour force}} \times 100$$

The *participation rate* is the percentage of the working age population that is in the labour force,

$$\text{Participation rate} = \frac{\text{labour force}}{\text{working age population}} \times 100$$

Measured unemployment may not be an accurate reflection of conditions in the labour market. Many people get discouraged and stop looking for work, and are therefore no longer counted as unemployed. Some people believe that the 'hidden' unemployed may be equally as high as the official, measured unemployment rate. Also, the unemployment statistics do not recognise the fact that many part-time workers are seeking full-time work, and many employed people are not working in their chosen field or utilising their qualifications (for example, university graduates working in bars/restaurants).

☐ *Read the introduction to Chapter 27 and sections 27-1 to 27-3 in Begg et al. (2000), pp. 448–53.*

From the reading in the text, note the significance of labour market flows, the duration of unemployment and the demographic composition of unemployment.

The unemployment rate is a very important indicator of the current state of the economy. There is much analysis of the labour market generally, and unemployment statistics in particular, in order to distinguish between different types of unemployment and different sources of unemployment. Once these distinctions have been made, it may be possible to devise appropriate economic policies to deal with the problem.

Labour force statistics for the Australian economy over the period 1986–97 are shown in Table 4.3.

Table 4.3: Labour force

	Labour force survey										
	Civilian population aged 15 and over	Labour force	Partici-pation rate	Employed persons			Unemployed persons	Unemploy ment rate	Aggregate weekly hours worked	Overtime worked per week	Vacancies, private sector
				Part time	Full time	Total					
	'000	'000	per cent	'000	'000	'000	'000	per cent	Index 1989/90 = 100	hours	'000
	nsa	sa									
1986/87	12 391	7 679	62.0	1 355	5 689	7 044	635	8.3	88.6	1.22	37.0
1987/88	12 653	7 867	62.2	1 434	5 823	7 256	610	7.8	92.4	1.35	40.6
1988/89	12 909	8 083	62.6	1 515	6 033	7 549	535	6.6	96.1	1.42	50.3
1989/90	13 140	8 346	63.5	1 640	6 192	7 832	514	6.2	100.0	1.45	40.8
1990/91	13 343	8 491	63.6	1 689	6 093	7 782	709	8.4	98.5	1.21	20.7
1991/92	13 528	8 518	63.0	1 752	5 885	7 637	882	10.4	96.1	1.10	16.8
1992/93	13 691	8 574	62.6	1 797	5 837	7 634	940	11.0	96.7	1.15	22.1
1993/94	13 854	8 696	62.8	1 851	5 929	7 781	915	10.5	98.9	1.25	33.9
1994/95	14 031	8 888	63.3	1 974	6 119	8 093	795	9.0	103.1	1.26	50.5
1995/96	14 236	9 066	63.7	2 039	6 261	8 300	767	8.5	105.5	1.13	48.3
1996/97	14 465	9 186	63.5	2 109	6 280	8 389	797	8.7	106.2	1.09	52.6

Source: Reserve Bank of Australia (1997), p. S115.

Question 4.8

Compare the changes in the participation rate to the changes in the unemployment rate over the periods from 1990–91 to 1995–96. Comment on these changes.

There are three main types of unemployment: frictional, structural and cyclical.

- *frictional unemployment* arises from labour market turnover;
- *structural unemployment* is due to the structural adjustments being made in the economy as some industries decline owing to changes in the pattern of demand, or to technological change;
- *cyclical unemployment* decreases or increases as the pace of economic growth expands or contracts.

There is a close, negative relationship between unemployment and real GDP (real GDP is discussed in more detail later in this topic). When real GDP is above its long-term trend rate of growth, the unemployment rate is low; when real GDP is below its trend rate, unemployment is high.

The human cost of unemployment is high in financial and psychological terms. However, the major costs are the lost output and income that could have been generated if the unemployed had been working, and the deterioration of human capital.

The following table shows Australia's long-term unemployment (i.e. the number of persons who have been unemployed for more than 52 weeks) for the period 1986–96. The duration of unemployment is considered to be an indicator of the severity of the unemployment problem.

Table 4.4: Long-term unemployment

	Unemployed persons '000s Duration of unemployment—more than 52 weeks	
1986–87	176.8	
1987–88	169.1	
1988–89	145.7	
1989–90	116.6	
1990–91	149.5	
1991–192	255.7	
1992–93	336.3	
1993–94	334.8	The peak level was 366,000 in March 1993
1994–95	273.6	
1995–96	226.5	

Source: ABS (1997).

Full employment is accepted by most economists and policymakers as a desirable economic objective, but there is little agreement as to what unemployment rate is consistent with this objective. Some unemployment is inevitable, particularly frictional and structural. Full employment is something less that employment of 100% of the labour force. The rate of unemployment which exists at full employment is usually called '*the natural rate of unemployment*' (NRU). Some economists define the NRU as 'the average level around which the unemployment rate fluctuates' (Mankiw 1994, p. 118), whereas others claim the NRU is 'the minimum sustainable level of unemployment below which inflation tends to accelerate' (Gordon 1990, p. G6).

Question 4.9

Is it easy to determine whether an economy is achieving full employment or not? Give reasons for your answer.

Question 4.10

Which of the following factors may have contributed to the rise in the rate of unemployment in Australia since the 1970s?

(a) An 0 in the participation rate of married women.

(h) Changes in employers' payroll tax.

Question 4.11

Can you name some policies which could be used to reduce, or prevent a rise in, the long run rate of unemployment?

Real vs nominal measures of economic activity

During the Australian recession of the early 1990s, while the level of economic activity decreased, the actual quarterly value of nominal GDP increased. A brief reflection on how the value of output is calculated will clarify this apparent paradox. The quantity of goods sold, multiplied by their current prices, determines the value of *nominal* output. If the quantity of goods sold declines from one period to the next but prices do not stay constant, the calculated value of nominal GDP may increase, decrease, or stay the same. Economists make adjustments for price change by the use of a price index. The resulting value is in *real* terms, that is, at constant prices.

Real GDP is the value of expenditures when all the goods and services within the different components of GDP are measured in the prices of a given base year. We can then calculate the GDP deflator which is an index showing the ratio of nominal GDP to real GDP. The GDP deflator is referred to as an *implicit price deflator* because the determination of the deflator index values is done after the value of real GDP has been determined. Nominal GDP for any previous year, divided by the GDP deflator for that year, gives real GDP.

To deflate an economic variable such as GDP by the use of a price index, we must first determine its value in a given year (i.e. the base year for prices). The value for any other year is then divided by the base year value. This ratio, multiplied by 100, yields an index number that reflects the percentage change in the average level of prices between the base year and the year in question.

Mathematically,

$$\frac{\text{Nominal GDP}}{\text{Real GDP}} = \text{GDP deflator}$$

For example, if the base year for the GDP price deflator is 1989–90, then an index value of 110 for 1990–91 means that the average price of all goods and services in the GDP rose by 10 per cent during that year.

☐ *Read Section 2-3 (pp. 19–20) and Section 20-5 (pp. 341–4) in Begg et al. (2000).*

Table 4.5 provides data on GDP at current (nominal) prices, and GDP at average 1989–90 prices for the period 1986–97.

Table 4.5: Gross domestic product—Expenditure components

($ million, sa)

	Average 1989/90 prices									
	Private spending					Increase in stocks				
	Consumption	Dwelling investment	Non-dwelling construction	Equipment investment	Public demand	Private non-farm	Farm & public authorities	Exports of goods & services	Imports of goods & services	Gross domestic product (expenditure measure)
			Excluding transfers							
1986/87	192 752	19 819	11 708	22 677	79 315	- 1 608	- 378	52 421	46 658	330 047
1987/88	199 679	22 411	13 945	24 588	78 934	1 471	- 773	56 719	51 344	345 630
1988/89	207 955	26 768	15 077	27 749	79 935	3 234	477	57 459	63 646	355 010
1989/90	217 077	23 798	16 058	26 389	84 816	2 207	3 173	60 625	67 007	367 132
1990/91	219 264	22 100	13 598	22 620	85 130	- 2 480	1 570	67 623	63 409	366 015
1991/92	225 097	22 698	10 779	21 344	86 950	- 1 647	- 515	73 730	65 800	372 636
1992/93	231 991	25 244	9 754	23 632	87 299	488	325	78 194	70 746	386 182
1993/94	240 022	28 466	10 131	25 694	87 876	1 428	- 431	85 858	76 216	402 829
1994/95	251 890	29 030	11 284	30 997	92 028	3 242	- 751	89 518	89 956	417 282
1995/96	261 732	25 590	13 709	32 937	93 478	2 511	- 6	99 048	95 471	433 529
1996/97	267 390	25 920	15 554	38 020	94 987	802	- 2983	108 857	107 043	441 503
1989/90										
Mar	54 569	5 778	3 969	6 379	21 909	163	445	15 464	17 116	91 561
Jun	54 782	5 689	3 773	6 160	21 439	333	750	15 639	15 826	92 739
1990/91										
Sep	55 106	5 667	3 637	6 196	21 605	- 983	884	16 036	16 514	91 634
Dec	54 693	5 551	3 506	5 670	21 135	- 876	1 015	16 437	15 802	91 329
Mar	54 678	5 520	3 273	5 671	21 290	- 242	211	17 029	15 513	91 917
Jun	54 801	5 394	3 162	5 161	21 446	- 412	- 489	18 027	15 575	91 515
1991/92										
Sep	55 652	5 395	2 830	5 401	21 934	- 919	- 250	18 308	16 024	92 327
Dec	56 043	5 551	2 626	5 177	21 884	- 221	- 307	18 387	16 584	92 556
Mar	56 268	5 730	2 705	5 289	21 620	- 119	- 52	18 325	16 314	93 453
Jun	57 109	5 976	2 560	5 409	21 472	- 406	123	18 695	16 962	93 976
1992/93										
Sep	57 628	6 057	2 438	5 316	22 212	- 126	241	18 888	17 388	95 266
Dec	57 821	6 312	2 460	6 458	21 826	- 249	- 91	19 752	17 922	96 367
Mar	57 947	6 430	2 421	5 968	21 404	322	314	19 470	17 476	96 800
Jun	58 551	6 488	2 426	5 880	21 538	509	- 201	20 073	17 974	97 291
1993/94										
Sep	58 824	6 864	2 424	6 152	21 467	- 602	102	20 633	18 305	97 558
Dec	59 768	6 969	2 460	6 149	21 514	752	- 111	21 208	18 615	100 095
Mar	60 677	7 169	2 584	6 412	22 544	447	- 146	21 891	19 243	102 335
Jun	60 777	7 518	2 670	6 917	22 291	815	- 283	22 189	20 092	102 803
1994/95										
Sep	61 909	7 585	2 644	7 441	22 912	949	- 740	22 167	21 603	103 264
Dec	62 459	7 406	2 808	7 758	22 856	1 362	- 79	22 508	22 477	104 601
Mar	63 257	7 189	2 814	7 828	22 973	519	- 160	22 718	23 069	104 069
Jun	64 162	6 788	3 022	7 863	23 283	439	257	22 389	22 871	105 332
1995/96										
Sep	64 460	6 681	3 351	7 770	22 944	812	491	23 694	22 890	107 313
Dec	65 335	6 365	3 422	7 716	23 371	354	- 74	24 234	23 153	107 570
Mar	65 544	6 188	3 356	8 651	23 829	525	- 323	25 559	24 474	108 856
Jun	66 239	6 336	3 581	8 750	23 291	811	- 116	25 362	24 989	109 265
1996/97										
Sep	66 189	6 134	3 873	8 691	23 347	870	103	25 786	24 978	110 016
Dec	66 702	6 274	3 891	9 289	23 633	390	- 184	26 152	26 524	109 624
Mar	67 003	6 579	4 251	9 410	23 775	- 951	- 99	26 930	26 852	110 046
Jun	67 625	6 929	3 572	10 439	24 196	507	- 2818	29 898	28 389	111 959
1997/98										
Sep	68 834	7 047	3 743	10 739	24 256	181	- 878	29 360	29 039	114 244

($ million, sa)
Current prices

	Private spending					Increase in stocks				Gross
	Consumption	Dwelling investment	Non-dwelling construction	Equipment investment	Public demand	Private non-farm	Farm & public authorities	Exports of goods & services	Imports of goods & services	domestic product (expenditure measure)
			Excluding transfers							
1986/87	157 100	13 924	9 493	21 413	68 714	- 1 293	- 256	44 031	47 894	265 229
1987/88	175 164	17 375	12 107	24 304	71 086	1 250	- 646	51 468	52 578	299 529
1988/89	195 529	24 543	14 068	27 265	75 993	3 172	343	55 110	60 734	335 288
1989/90	217 076	23 797	16 059	26 377	84 822	2 207	3 173	60 625	67 007	367 130
1990/91	230 121	21 896	13 890	23 035	89 153	- 2 606	1 236	65 988	65 220	377 490
1991/92	242 404	22 164	10 715	22 013	93 911	- 1 806	- 239	69 753	67 439	391 477
1992/93	254 548	24 985	9 582	25 759	96 446	438	160	76 465	77 400	410 983
1993/94	267 134	28 844	10 068	28 504	98 057	1 426	- 166	82 500	83 496	432 873
1994/95	283 718	29 983	11 377	33 535	102 349	3 465	- 676	87 082	95 680	455 153
1995/96	302 629	27 198	14 116	34 881	105 843	2 721	309	98 275	99 037	486 933
1996/97	314 031	27 952	16 266	36 585	108 810	1 052	- 2 440	104 346	101 507	505 095
1989/90										
Mar	55 035	5 842	4 008	6 455	22 006	182	376	15 468	17 222	92 151
Jun	56 040	5 778	3 835	6 113	21 939	413	941	15 772	15 952	94 878
1990/91										
Sep	56 787	5 610	3 714	6 275	22 324	- 1 036	515	15 847	16 349	93 688
Dec	57 499	5 490	3 600	5 743	22 211	- 897	750	16 557	16 613	94 339
Mar	57 813	5 475	3 350	5 869	22 422	- 248	81	16 658	16 297	95 124
Jun	58 136	5 343	3 204	5 222	22 633	- 477	- 377	17 037	16 001	94 719
1991/92										
Sep	59 562	5 287	2 853	5 667	23 307	- 963	- 139	17 215	16 182	96 606
Dec	60 278	5 453	2 624	5 301	23 777	- 308	- 260	17 331	16 830	97 367
Mar	60 750	5 593	2 076	5 486	23 423	- 181	145	17 523	16 981	98 434
Jun	61 824	5 807	2 501	5 488	23 430	- 371	147	17 884	17 563	99 146
1992/93										
Sep	62 723	5 959	2 408	5 691	24 143	- 81	126	18 546	18 731	100 784
Dec	63 221	6 231	2 421	7 012	23 876	- 330	- 30	19 463	19 699	102 166
Mar	63 949	6 364	2 379	6 695	23 909	312	- 30	19 245	19 231	103 592
Jun	64 709	6 470	2 364	6 354	24 160	527	- 69	19 565	19 838	104 241
1993/94										
Sep	65 156	6 838	2 394	6 958	23 843	- 518	31	20 415	20 699	104 419
Dec	66 530	7 035	2 447	6 924	24 007	686	- 47	20 941	20 896	107 626
Mar	67 618	7 292	2 589	7 185	25 062	408	41	20 666	20 634	110 226
Jun	67 878	7 721	2 649	7 382	24 729	840	- 134	20 866	21 285	110 648
1994/95										
Sep	69 217	7 792	2 646	8 145	25 513	1 026	- 564	20 929	22 734	111 969
Dec	69 968	7 665	2 832	8 444	25 247	1 344	- 21	21 531	23 447	113 565
Mar	71 452	7 440	2 849	8 444	25 459	399	- 148	22 333	24 458	113 770
Jun	73 012	7 032	3 056	8 375	26 150	743	179	22 915	25 136	116 325
1995/96										
Sep	74 060	6 978	3 426	8 512	25 761	899	657	24 193	24 578	119 910
Dec	75 398	6 726	3 501	8 366	26 588	386	- 158	24 126	24 472	120 462
Mar	75 953	6 554	3 467	9 100	26 902	466	- 80	25 431	25 272	122 522
Jun	77 041	6 917	3 724	8 868	26 621	973	- 321	24 749	24 754	123 817
1996/97										
Sep	77 326	6 660	4 061	8 706	26 835	840	- 195	24 939	24 384	124 788
Dec	78 184	6 802	4 068	9 202	27 052	401	- 170	25 142	25 343	125 339
Mar	78 908	7 076	4 407	8 948	27 177	- 829	311	25 867	25 277	126 588
Jun	79 832	7 413	3 761	9 564	27 697	658	- 2 179	28 787	26 237	129 297
1997/98										
Sep	81 426	7 680	3 983	9 904	28 162	183	- 822	28 575	27 251	131 839

Source: Reserve Bank of Australia (1997), pp. S119–20.

What do you notice about the changes in GDP according to current versus average prices?

Many economic variables are measured in both nominal and real terms. This means we deflate the nominal (or current) value of such variables as wages, interest rates, money balances, exports, imports, exchange rates, and income, by the use of a price index with a given base year. The distortion caused by the change in prices from the base year to the current year has been removed and the true increase or decrease in the rate of growth of the variable can be determined.

The rate of growth of real GDP is a very important macroeconomic concept. It is the standard statistic by which economists measure economic growth. Real GDP will increase if factors of production increase, if there is technological change, or if there is more efficient use of available resources.

Limitations of real GDP as an economic indicator

There are some limitations to the use of real GDP as a measure of economic welfare. Unfortunately, real GDP does not accurately measure all the goods and services we produce, and it provides no information on the amount of leisure time enjoyed by citizens, nor the degree of equality among individuals. GDP is overstated in that it does not record environmental damage and pollution controls as negatives. It is understated in that the 'underground economy', non-marketed production and leisure time are not included. GDP does not take distribution of income into account nor does it indicate the composition or quality of production and these factors are important aspects of *economic welfare.* Begg et al. (2000, p. 334) refers to the work of Nordhaus and Tobin who suggested a new measure called *net economic welfare (NEW)* in which GDP is adjusted for economic 'bads' and non market activities. But measures for NEW are not fully refined yet so real GDP still remains the most commonly used measure of economic activity. Although real GDP is not a perfect measure of economic welfare or economic activity, it is able to give us some insight into the directions of change, i.e. whether we are in a period of expansion or contraction.

☐ *The complex relationship between GDP and social welfare is highlighted in Reading 4.1. Read 'Policy perspective: Social welfare and GDP' now and try to answer the two questions at the end of the reading. Brief answers are provided under 'Suggested answers'.*

Question 4.12

(a) Why is it so important to distinguish between real and nominal GDP measures?

(b) Complete the following table:

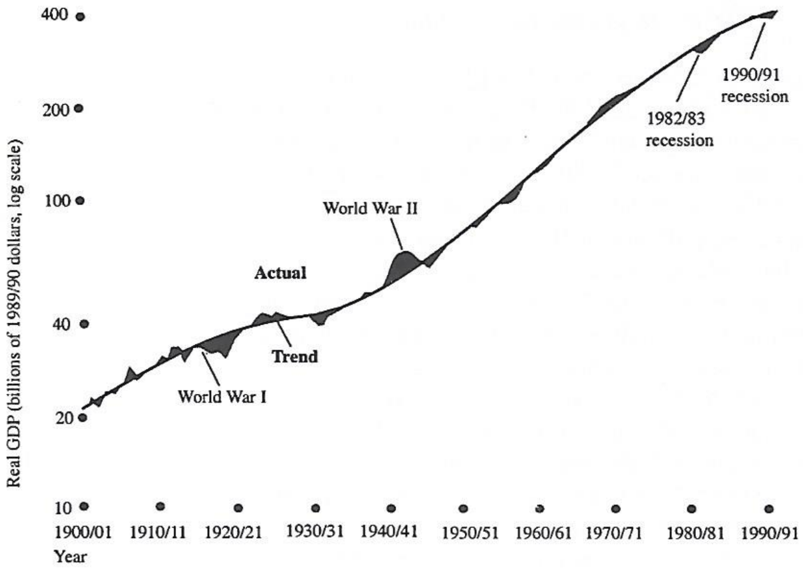
Year	Nominal GDP $m	Real GDP $m	GDP Deflator 1989–90 = 100
1991/92	391,097	–	104.9
1992/93	–	384,967	106.3
1993/94	430,140	400,185	–
1994/95	–	414,239	109.5
1995/96	487,288	–	112.6

(c) Once the table is completed, calculate the annual percentage rate of growth of nominal GDP and of real GDP, and the annual rate of inflation.

Recent performance of the Australian economy

The following graph shows the economic growth record of Australia since the turn of the century.

Figure 4.1: Real GDP: 1900–01 to 1993–94



Real GDP has grown at an annual average rate of just over 3 per cent between 1900–01 and 1993–94. But the growth rate has not been the same in each year. In some periods, such as the early years of World War II, real GDP expanded quickly and was above trend (blue areas). In other periods, such as the Great Depression, the mid-1940s and, more recently, in 1982–83 and 1990–91, real GDP declined below trend (red areas).

Source: McTaggart et al. (1996) p. 508.

Factors which may contribute to an increase in the trend rate of growth are:

- growth in the labour force;
- increase in the stock of capital equipment;
- improved technology;
- more efficient use of available resources. (McTaggart et al. 1996, p. 509)

The graph shows the slowdown in growth in the mid-1970s as well as the recessions of the early 80s and early 90s.

> The choices people make to balance the benefits and costs of economic growth determine the actual pace of economic growth and, consequently, our standard of living. The public choices made by the government also affect the pace of economic growth. Government polices affect the quantity of resources devoted to research, development, and invention, and they also affect how efficiently we use our current resources and prepare for change.

Source: McTaggart et al. (1996), p. 512.

☐ *Now read Reading 4.2 for a brief review of the outlook for countries and regions of key importance to Australia.*

Question 4.13

What are the economic costs associated with high inflation? What factors have brought about the low inflation rates being experienced by many countries in the mid-1990s?

Question 4.14

What factors have contributed to the slowdown in the economic growth of some East Asian economies in the last 3 years?

Summary

A central question of macroeconomics is whether, and to what extent, the government is able to influence the achievement of macroeconomic objectives via the manipulation of policy variables. Is it possible to avoid recessions or economic slowdowns through correct use of monetary, fiscal or other policies? One extreme view suggests that inflation and recessions are results of policy mistakes by the government. Experience in policy analysis shows us that the real world economy is complex and difficult to model in a manner that leads to accurate predictions. Macroeconomics is still, however, extremely valuable in explaining the likely consequences of a change in a policy variable on the economy, *ceteris paribus*.

The aim of this topic was to introduce you to the core of macroeconomic theory and policy, and to make you aware of the debates and positions that will enhance your understanding of the complexities of a modern economy. The circular flow diagram illustrated the fundamental identity of national income accounting. We used this accounting identity to measure economic activity and noted that any measures have to adjusted to account for inflation in order to get an accurate indication of rates of growth. The three statistics discussed in this topic—GDP, inflation and the unemployment rate—quantify the performance of the economy. Public and private decision makers use these statistics to monitor changes in the economy to formulate appropriate policies.

Having learned how to measure economic performance we now turn our attention to the issues surrounding prediction of economic behaviour. This necessarily involves a discussion of forces that determine the equilibrium values for various markets within the macroeconomy. We model total spending in the economy to determine what are the important variables that influence it, and then compare planned spending to actual levels of income. This is the subject we turn to in the next topic.

Review questions

Review question 4.1

Do the simplifying assumptions and restrictions that are made when developing an economic model result in the model being unrealistic and useless?

Review question 4.2

Discuss the shortcomings of GNP as a measure of output and economic well being.

Review question 4.3

Would you expect GDP to be less than or greater than GNP? Explain.

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Suggested answers

Topic 4

In-text questions

Question 4.1

It is not always obvious whether these issues are specifically concerned with microeconomics or macroeconomics. They can have facets of both. However, they could generally be classified as follows:

(a), (c) and (e)—micro issues

(b), (d) and (f)—macro issues.

Question 4.2

In this question, you are merely asked to give an opinion on each of the statements. All of you would have had some ideas about the these issues. We discuss these issues in more detail at the appropriate time throughout the course.

Question 4.3

(a) Total planned expenditure is 200. Planned consumption (150) plus planned investment (50).

(b) Production (210) less expenditure (200) represents an unplanned addition to inventories of 10.

(c) Income (210) less consumption (150) is 60.

(d) Planned investment (50) plus stock changes (10) is 60. Thus, actual investment equals actual saving.

(e) Producers have not sold as much output as they expected and therefore have an increase in stock levels. Two responses are possible: to reduce output or reduce price. If we assume prices are fixed the response will be to reduce output.

Question 4.4

(a) While it appears that goods sold from last year's stocks will increase GDP since current expenditure rises, this is offset by a corresponding decrease in inventories. GDP counts this year's actual production.

(b) The purchase of the bond would have no effect on GDP because it is not considered a productive transaction. It is just a transfer of money capital from an individual to the government. The $100 interest earned is regarded as factor income received by the individual as a return on capital.

(c) GDP will increase by $2000. This is the value of the productive service performed by the importing supermarket.

Question 4.5

The general rule to adopt is, if an item can be valued and is reported, then, it is notionally part of GDP, and it will be included. This means that (a), (b), (d), (f), and (h), will be included although we cannot always guarantee the full reporting of all these items. Item (c) relates to a transfer payment and in not notionally part of GDP. (e) is immeasurable. (g) cannot easily be valued, although GDP will include wages paid to those responsible for providing leisure services. Fruit picked in the countryside is neither valued nor reported.

Question 4.6

A 5% increase in the CPI means that there has been an average price increase of 5%. Not all prices have risen at the same rate and not all items of expenditure are given the same weight in the index—an increase in the price of houses will have a bigger impact on the price index than an increase in the price of pencils. The market basket of goods and services included in the CPI is not necessarily representative of all families therefore even if price level has increased on average by 5%, some people may find their cost of living has not gone up by that much.

Question 4.7

If you, as a business manager, anticipate the inflation rate will rise to 10% over the next two years, it would affect the way you decide to allocate the resources of your business. Inflation induces people to undertake activities they would not have chosen in the absence of inflation.

Anticipated inflation affects the labour market. Workers will want shorter contracts and will want to renegotiate more often. Resources and effort are diverted into these negotiations and the working environment becomes much more uncertain. Anticipated inflation pushes workers into higher nominal tax brackets and therefore reduces the after-tax returns to labour.

Investment in plant and equipment becomes less attractive with anticipated inflation. The real value of depreciation is eroded with inflation and it also affects accounting for stocks (inventories). Individuals and firms seek other types of investment that will provide a hedge against inflation. Investment is diverted into activities in which there is a possibility of a high capital gain. Investment is plant and equipment is reduced, while investment in property and other assets that have a high return increases. The mix of the capital stock deteriorates and economic growth slows.

Question 4.8

An increase in the participation rate means that more people are working or seeking work. From 1990–91 to 1992–93, the participation rate fell by 1% (that represents approximately 1,300 people). At the same time, the unemployment rate increased by 2.6%. The fact that some people had stopped looking for work means that the unemployment rate was not as high. In times of recession, the participation rate tends to go down; in boom times the participation rate tends to increase. From 1993–94 to 1995–96, the participation rate rose by 0.9% and the unemployment rate dropped by 2.0%. The unemployment rate would have been lower if more people had not come back into the labour force.

Question 4.9

It is difficult to determine whether the economy is achieving full employment or not because it is not clear what we mean by full employment. There will always be some (frictional and structural) unemployment in a dynamic economy; it is not easy to accurately measure the number of unemployed, nor is it easy to determine the types of unemployment that are in existence. The official statistics are often very misleading due to the problems of measurement. The labour market is large and diverse; unemployment is often concentrated in certain industries or areas. We may experience a shortage of workers in some areas, yet have high unemployment in others. In the short run the level of unemployment may fluctuate due to particular economic disturbances so it is also difficult to work out long term trends. In recent years the percent of the labour force unemployed, at full employment, has risen.

Question 4.10

(a) Increased unemployment benefits may account for some increase in the unemployment rate, but much less than is generally supposed. People make their work /leisure choice for all sorts of reasons, one of which may be the amount of money they can receive whilst unemployed.

(b) If we are not as competitive on world markets, it means we are not selling as much as we could, so this can be a cause of unemployment.

(c) Trade union power may lead to an increase in unemployment in some circumstances. Union members want to preserve their jobs and may not be concerned about those who do not have a job. However, unions may be able to negotiate workplace agreements which prevent the dismissal of employees.

(d) If world trade declines due to trade restrictions and the formation of trade agreements which exclude some countries, unemployment may increase for we are not able to sell as much to the rest of the world. However, our import competing industries may benefit.

(e) This has contributed greatly to the rise in unemployment because it has generated much structural unemployment through the skills mismatch effect.

(f) Technological change may have resulted in a fall in demand for some types of labour. But there is a compensating increase in demand for workers with technical expertise.

(g) If the number of women entering the labour force increases, this may result in higher unemployment if the number of jobs available has not increased. Women have tended to take up part-time work as that has become available, whereas the unemployed may have been looking for full time work.

(h) If employers have to pay more taxes when they employ more workers, this may result in increased unemployment if the extra workers do not generate sufficient extra revenue for the firm.

Question 4.11

Some polices which could be used to reduce unemployment are as follows:

- Force firms to make high redundancy payouts to discourage firms from sacking workers too readily.
- Reduce, or eliminate, unemployment benefits.
- Reduce wages.
- Expand government spending.
- Subsidise manufacturing industry.
- Increase education and training in order to raise labour productivity.
- Promote competition and free trade.

Question 4.12

(a) It is important to distinguish between real and nominal values in order to determine the performance of the economy. Nominal variables are distorted by price changes. We deflate the nominal value by a price index in order to determine the actual change in the particular variable.

(b) The completed table is as follows:

Year	Nominal GDP $m	Real GDP $m	GDP Deflator 1989–90 = 100
1991/92	391,097	372,828	104.9
1992/93	409,220	384,967	106.3
1993/94	430,140	400,185	107.5
1994/95	453,592	414,239	109.5
1995/96	487,288	432,760	112.6

(c) The rates of growth (in per cent) are:

Year	Nominal GDP	Real GDP	GDP Deflator
1991/92	3.87	2.04	1.7
1992/93	4.64	3.35	1.3
1993/94	5.1	3.95	1.03
1994/95	5.54	3.51	1.95
1995/96	7.33	4.4	2.8

Question 4.13

High inflation:

(a) Misallocates resources by distorting investment decisions.

(b) Clouds relative price signals.

(c) Generates uncertainty.

(d) Affects distribution of income and wealth.

Factors which have contributed to low inflation:

(a) Internationalisation of the world economy .

(b) Increased productivity and lower prices.

(c) Improved anti-inflation policies and greater commitment to low inflation.

(d) Structural adjustment and global competition.

(e) Productive capacity not fully utilised.

Question 4.14

Factors which have contributed to the slow down in economic growth in some East Asian economies include:

- slowdown in export growth (see Box 2 in the article):
- falling asset prices and increased number of non-performing loans has highlighted the need for reform of the financial sector in some of the economies;
- decrease in the availability of funds for investment;
- relatively high interest rates;
- exchange rate rigidity.

Questions from Reading 4.1

1. If the portion of an economy's GDP spent on health care increases over time, this may not mean an increase in society's well-being. We would have to consider whether the increased health problems of the population were as a result of increased production causing pollution and environmental damage. GDP does not take into account product quality, product improvement or the distribution of benefits. There may be increased expenditure on health care but it may not be for general community medicine or be widely available for the general public.

2. Coffee breaks and sick leave affect GDP in that they reduce the number of hours worked. But if such working conditions mean that workers are happier in the work place when they are there, it may result in increased productivity which will increase GDP in the long run.

Review questions

Review question 4.1

The actual economy is so large and complex that it is necessary to make simplifying assumptions. In general, three basic rationales can be given to defend the restrictive models. First, simplification is the essence of model building. We simplify the structure of the economy so that useful results concerning the economy might be derived. If the model is made too complex by rejecting all the restrictive assumptions, it becomes highly difficult to get insights into the economy and the answers to the policy questions. The second rationale is that very often an economic model focuses on a small aspect or phenomenon of the economic system and attempts to clarify that single phenomenon. An example is the simple Keynesian model which you will study in Topic 5. This model incorporates several restrictive and unrealistic assumptions but nonetheless is quite useful in explaining the influence of aggregate demand for goods and services on the national income. The third rationale is based on the 'as if' principle, which states that for many intents and purposes the economy can be usefully thought of 'as if' it were behaving according to a particular model. Economic models based on the 'as if' principle are designed to enable economists to quantify certain economic variables.

Review question 4.2

GNP is an imperfect measure of output because it ignores both non-market production and the underground economy. As an indicator of economic as well as GNP is even more faulty because it ignores environmental quality, value of leisure, and the fact that some economic activity is relating more to dealing with 'bads' than with producing goods.

Review question 4.3

As GNP is the value of all final goods and services produced by domestically owned factors of production, and GDP is the value of final goods and service produced within the country. GNP may be greater than or less than GDP. If GNP exceeds GDP for a given country (say Australia) it means that Australian corporations and residents who owned factories overseas, or who worked abroad, earned more in the foreign countries than foreign firms and individuals earned in Australia. GDP is greater than GNP if the opposite is true.

Policy perspective: Social welfare and GDP

Reading 4.1

It is easy, and tempting, to look at GDP as a measure of a society's well-being. Yet it was never intended to be a measure of social welfare. It is simply an accounting measure of economic activity. While there is certainly reason to believe that an economy is 'better off' if it has a large real GDP—more goods and services for all—this is not necessarily the case. On the other hand, a society may become better off in ways that GDP simply does not measure. Let's consider some of the 'goods' and 'bads' that GDP does not measure.

Product quality

A generation ago, even a multimillionaire couldn't buy the kinds of medicines commonly available to the person of average means today. Yesteryear's cars didn't have four-wheel brakes, automatic transmission, power steering, air bags and a host of safety features commonly found in today's cars. Suppose you were given a Myers Stores catalogue for 1950 and a copy of a recent Myer catalogue, with the prices in each listed in the same constant dollars. From which one would you rather buy sporting equipment, radios or kitchen appliances?

Because GDP is a quantitative rather than a qualitative measure, it does not measure product improvement—or the development of new kinds of goods. The GDP in 1950 did not include the kinds of goods that are included in today's GDP. But, when their value is measured in dollars alone, yesterday's products are indistinguishable from today's.

Costs not measured: pollution

GDP does not measure many of the by-products associated with producing the goods and services that are measured by GDP. And many of these by-products are 'bads'—smoke, noise, polluted rivers and lakes, garbage dumps. The costs of health problems (both physical and mental) caused by such environmental blight are either not measured at all or do not show up until years after the production that caused them. Undesirable by-products tend to increase with growth in GDP. If the costs of these bads were subtracted from GDP, the resulting GDP would not appear as large or grow as fast. It would also be a more accurate measure of society's true well-being.

Some economists have experimented with alternative measures, which try to incorporate by-products, so as to derive measures of economic welfare. The best known example is the 'net economic welfare' measure suggested by the US economists Tobin and Nordhaus. A few European governments have also been making efforts to estimate such measures in addition to GDP.

GDP and sustainable development

Over the past two decades, many commentators have become worried that the pursuit of GDP growth in the short run will endanger the longer term position of the world's economy. This has led to much interest in the issue of sustainable development— 'development which meets the needs to the present without compromising the ability of future generations to meet their own needs'. These commentators have suggested several possible scenarios, ranging from continued exponential growth through steady state situations to a scenario in which we rapidly approach the end of civilisation. Long-term movements in GDP certainly have an important relationship with where we are heading. Exploitation of the world's resources in the short run may lead to strong GDP growth initially, but this is then likely to subside. Current levels of GDP show only part of the longer term social welfare picture.

Many commentators perceive a steady state brought about by a number of positive and negative forces interacting. The positive forces include building up the current capital stock to provide future generations with shelter, productivity, transportation and human capital. The negative forces include the impact of fossil-fuel combustion on climate change, the impact of chlorofluorocarbons on the world's ozone layer, adverse impacts on genetic development resulting from the storage of radioactive wastes, and the reduction of biodiversity.

Leisure and GDP

For most people, a certain amount of leisure is desirable. When people take more of it, less working time is devoted to producing goods and services. This means that GDP will be smaller than it otherwise might be. However, this increase in leisure must add to people's sense of well-being more than enough to offset the forgone output, or else people wouldn't have chosen to take it. Therefore, it would be completely misleading to interpret the reduction in GDP that results from increased leisure as a reduction in society's well-being. For example, the length of the average working week has been cut roughly in half over the last century. Workers have chosen to take more leisure, and as a result GDP is not as large as it would be if workers put in as many work hours as they typically did a hundred years ago. However, it would be erroneous to conclude that society is worse off because GDP is not as large as it could be. Why? Because more leisure has been chosen *in preference* to the additional output.

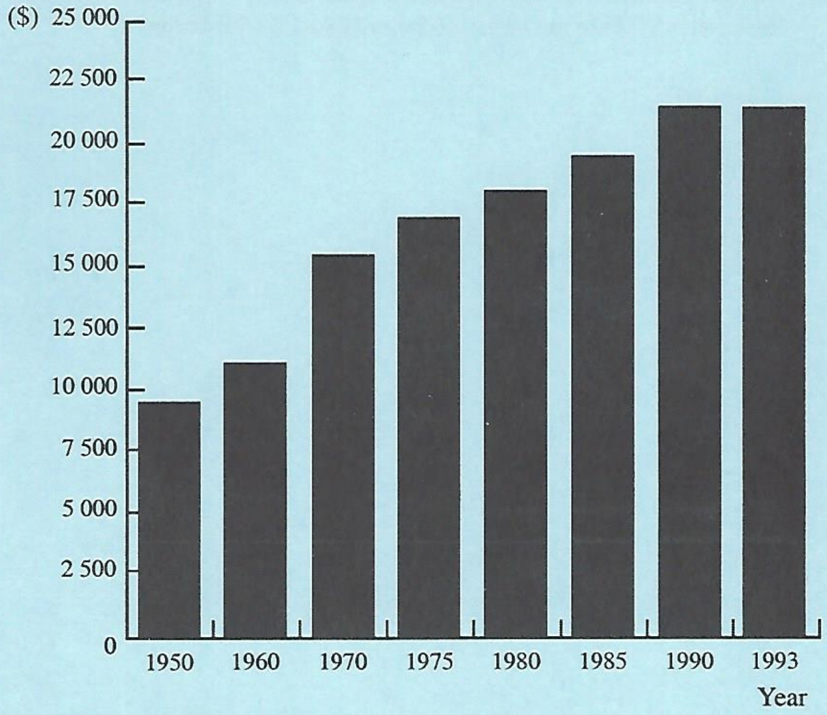
Per capita GDP and the distribution of output

If we divide up a side of beef among five people, each individual will certainly be better off than if we decide to divide it up among ten people. Similarly, in order to assess how well off a nation is, we need to know more than just the size of its annual output (that is, its real GDP). We also need to know how that output is divided among its citizens. If it were divided equally among them, then we would simply divide the nation's GDP by its population. This gives **per capita GDP.**

Figure P18.1 shows how real per capita GDP (in 1989/90 dollars) has grown since 1949/50 in Australia. In the late 1980s and early 1990s, Australia's real per capita GDP hardly moved.

Although there is no economy in which GDP is distributed equally among its citizens, per capita GDP gives a simple measure of how well off an economy would be if its GDP *were* divided up in this fashion. For example, while we saw in Table 18.1 above that in 1991 the GDP of the Philippines at US$44.9 billion was approximately the same size as that of New Zealand at US$42.9 billion, the Philippines had a population more than 18 times larger than New Zealand's. Consequently, per capita GDP in the Philippines was US$714, while in New Zealand it was US$12 606. Hence, despite the fact that both nations had about the same level of GDP, New Zealand citizens appeared to be much better off than those of the Philippines.

Figure P18.1: Real per capita GDP in Australia (1989/90 dollars)



Source: Australian Bureau of Statistics

Because an economy's GDP is typically distributed unequally among its citizens, it is necessary to study this distribution in more detail in order to get a more accurate assessment than that provided by per capita GDP.

Composition of GDP

The kinds of goods produced by an economy are completely hidden from view by a GDP figure. One economy could have a $100 billion GDP composed entirely of weapons for war; another could have a $100 billion GDP composed entirely of sports cars, steak dinners and fine clothes. These economies would clearly have different kinds of living standards, though you could never tell it from the GDP data. GDP alone tells nothing about the composition of an economy's output. The composition of GDP in industrialised economies has shifted more towards the production of services and away from production of non-durable goods in the past 50 years. Standing at around 40 per cent in Australia immediately after the end of World War II, the service sector now accounts for more than 60 per cent of GDP. Durable goods production and expenditure on construction have tended to maintain their relative percentage contributions.

Questions

1 Suppose the portion of an economy's GDP spent on health care increases over time. What considerations would be important in deciding whether or not this represents an increase in society's well-being?

2 How do coffee breaks and sick leave affect GDP? Which sort of time loss affects GDP in the same direction as social well-being?

Source: Waud, R., Maxwell, P., Hocking, A., Bonnici, J. & Ward, I., *Economics,* 3th edn, Addison Wesley, Longman, Sydney, 1996, pp. 524–5.

World economic outlook

Reading 4.2

As outlined in Statement 2 of the 1997–98 Budget, the world economy overall is expected to experience continuing strong economic growth and low inflation in the year ahead. This outlook depends on three key assessments.

- *The current low inflation environment will be sustained. Inflation has been reduced across most regions and is expected to remain low, including in the United States. However, if inflation in the US increases significantly, higher interest rates could adversely affect the outlook for world economic growth.*
- *Export growth in East Asia will pick up after last year s slowdown, despite underlying economic problems. If these problems are not addressed, economic prospects in the region could be adversely affected.*
- *Medium-term fiscal consolidation will continue in most of the industrialised world.*

This article briefly reviews the outlook for countries and regions of key importance to Australia in the light of developments since the Budget and considers the likely impact on the global economic outlook of the three issues listed above.

Outlook for world economic growth

The outlook for the international economy remains consistent with that outlined in the May Budget; economic growth rates in the major industrialised economies are expected to converge to between 2 and 3 per cent in 1997–98, while economic growth is expected to remain robust in East Asia.

The *United States* has entered its seventh year of sustained economic growth. Unemployment has fallen to around 5 per cent (its lowest level for 23 years) while inflation remains subdued. Economic growth surged in the last quarter of 1996 and the first quarter of 1997. However, since then activity appears to have moderated and economic growth is expected to return to broadly sustainable levels in 1997–98 (around 3 per cent); inflation is not expected to pick up significantly over this period.

The underlying strength of the **Japanese** economy remains difficult to gauge. In the first quarter of 1997 growth was very strong, but this was in part the result of spending being brought forward in anticipation of the 1 April rise in consumption tax. Economic growth is likely to moderate considerably in the second quarter of 1997, as the bring-forward of consumption is reversed. Despite continued fiscal consolidation and the recent appreciation of the Yen, growth is still expected to continue at a moderate rate of 2 to 2.5 per cent per annum in 1997–98, with the private sector replacing public expenditure as the main source of growth. While there will be a small one-off increase in the price level associated with the increase in the rate of consumption tax, no sustained inflation pressures are evident.

Economic growth in **Continental Western Europe** is expected to improve to between 2 and 2.5 per cent in 1997–98, but remain patchy. Significant spare capacity remains across Europe, with few signs of inflation pressures. It is difficult, however, to predict what effect the recent French election will have on momentum towards the achievement of the Maastricht fiscal targets, and more generally towards a single European currency. The risks surrounding forecasts for Continental Western Europe have increased since the Budget.

Growth in the **East Asian**[1] economies is expected to pick up slightly to around 7 per cent in 1997–98, with North East Asia[2] contributing most to the region's higher growth. Although growth is likely to be lower than in recent years, it will remain high by OECD standards. Some economies have been affected by weak export demand over the past year but overall export growth is expected to improve by the end of 1997. Inflation pressures are likely to remain relatively moderate, but could be affected by the recent currency depreciations in a number of countries.

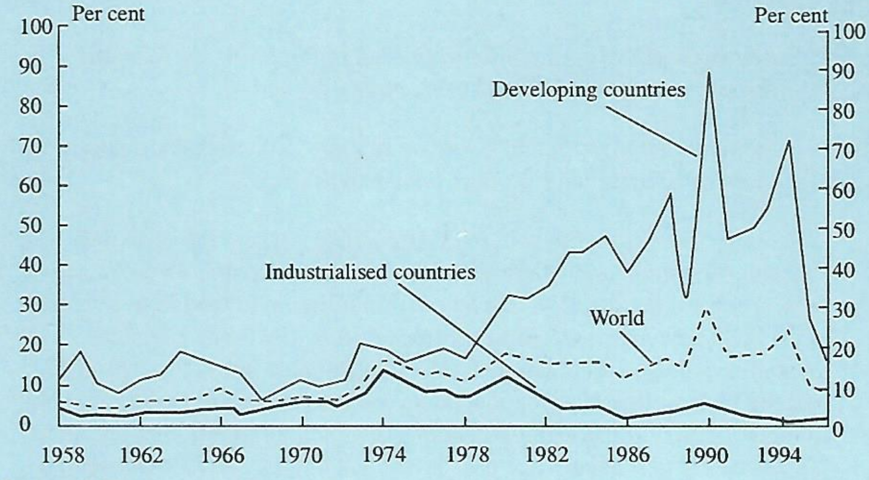
Lower inflation—will it continue?

One of the most notable international economic developments of the 1990s has been the general fall in inflation experienced across the world economy. This decline has been evident both across regions and among countries at different stages of development. While it has been most apparent in developing countries, where inflation had risen to very high levels, the industrialised countries have also been successful in reducing their average inflation rate; from the double digits experienced in the mid-1970s, back to the low single digit levels experienced in the 1950s and 1960s (see Chart 1).

The general reduction in inflation over the 1990s is a significant achievement because inflation can impose significant economic and social costs. By clouding relative price signals and generating uncertainty, inflation distorts investment decisions and the allocation of resources and adversely affects economic efficiency and growth. Moreover, inflation can also have significant effects on the distribution of income and wealth.

Several factors have been associated with the general lowering in inflation in the 1990s. One has been the ongoing internationalisation of the world economy.

Chart 1: Inflation[3] (annual percentage change)



Source: IMF.

- Increased openness to trade through reductions in protection has helped restrain inflation. Cheaper imports have directly reduced inflation, and greater openness has increased the incentives for domestic firms to set the prices of their products competitively.

- In addition the introduction of improved production techniques, partly through foreign investment, has led to increased productivity and lower output prices, particularly in developing countries.

The second factor has been the adoption of sustained anti-inflation policies, as governments and central banks have learnt from the experience of the high inflation decades of the 1970s and 1980s.

- Foremost among these lessons is the importance of stopping inflation before it gains momentum. The global experience of the past thirty years has been that the short-run costs in terms of unemployment and lost output of pre-emptive actions to arrest incipient rises in inflation are likely to be far smaller than the long-run costs of allowing inflation to rise to high levels.

- Expectations of future inflation are important determinants of current inflation—thus, establishing credibility in the fight against inflation is crucial. Central banks that firmly establish and maintain an anti-inflation reputation will likely garner a 'credibility bonus', which will enhance the effectiveness of monetary policy in maintaining low inflation.

- In view of their dependence on trade and the detrimental impact relatively high inflation can have on export competitiveness, the East Asian economies have been aware of the need to contain inflation.

- Structural policies can also help to restrain price pressures. For example, policies that increase labour market flexibility or domestic product market competition can have a similar impact on prices as trade liberalisation.

Global inflation appears unlikely to increase significantly in 1997–98, because:

- policy makers generally are committed to maintaining low inflation, and have learnt from the lessons of the high inflation 1970s and 1980s;
- increased global competition across all regions will continue to restrain excessive wage and price increases; and
- relatively large output gaps remain in many countries, particularly those of Continental Europe, Canada and Japan.

The main risk to inflation is in the United States, where the economic upswing is mature, and where little spare capacity exists. As discussed in Box 1, several factors have helped restrain inflation in the US over recent years and some are expected to continue during 1997–98. Economic growth is expected to moderate to more sustainable levels through 1997 and the Federal Reserve Board appears ready to apply pre-emptive monetary policy if there are indications of a pick up in inflation pressures. Nevertheless, past experience has shown that a failure to halt emerging inflation pressures can quickly result in an increase in inflation expectations, which in turn can require a sustained period of tighter monetary policy to correct.

If inflation in the US were to pick up significantly in 1997–98, higher long-term and short-term interest rates would result, lowering the outlook for activity in the US and in the world economy more broadly. In particular, this would have adverse consequences for the recovery currently underway in Japan and the pick up in growth expected in Continental Western Europe, as lower growth in the US would reduce demand for imports and world-wide long-term interest rates would rise in response to expectations of higher inflation in the US. In addition, higher interest rates in the United States could reduce the flow of capital to some developing countries.

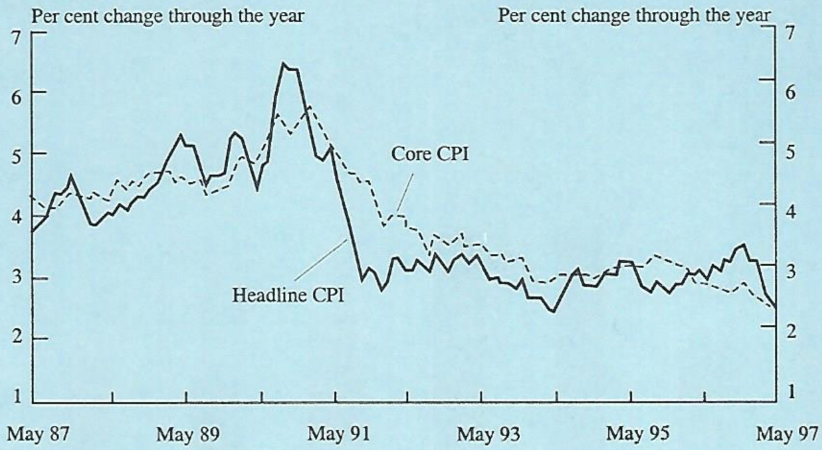
Box 1: The US inflation experience over the 1990s

Over the past 18 months, the US economy has been operating at levels that many have considered to be above its output potential. During this period, growth has accelerated, employment growth has remained strong and the unemployment rate has fallen to a 23 year low, around 5 per cent. At the same time, core inflation has trended down (see Chart B1) and there have been no unambiguous signs of a strong upturn in labour costs.

Over the 1990s, several factors have helped restrain inflation, including:

- the consistency of the (moderate) rate of economic growth since 1991—as the United States economy has generally grown at rates broadly consistent with its growth potential, marginal resources (particularly unemployed labour) have been engaged more smoothly and with less impact on prices than would have been the case if economic growth had been more volatile;
- reduced job security—major restructuring of work arrangements in the 1980s and early 1990s appears to have contributed, amongst other factors, to labour attaching lower priority to wage increases relative to job security;

Chart B1: US inflation



- lower growth in health care costs—as health care costs are a significant part of overall wages and benefits paid to workers, the reduction in their rate of growth, evident since the 1980s, has helped restrain growth in employment costs;
- the increased competition in US product markets due to increasing import penetration and contestability of markets; and
- falling import prices due to the appreciation of the US dollar and benign energy prices resulting from weak demand in other industrialised economies.

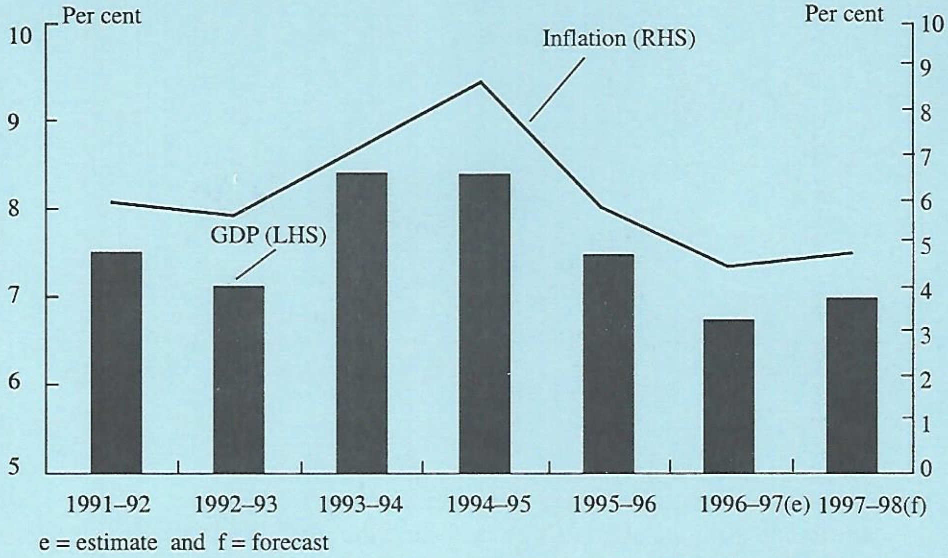
With growth expected to return to moderate levels through the remainder of 1997 and 1998, there does not seem to be strong evidence to suggest that US inflation will pick up over this period. Nevertheless, with the economy operating at around capacity, the risks are predominantly on the upside.

East Asia: stronger export growth, but financial market instability highlights risks

The East Asian economies averaged nearly 8 per cent annual growth in the four years to 1994–95 (see Chart 2) fuelled, in part, by strong growth in exports. Since then growth has moderated and is expected to average around 7 per cent in 1997–98. While policy makers in some countries took restraining action to help counter inflation and rising current account deficits, a marked slowing in export growth was also a key factor in the region's lower rate of growth (see Box 2).

By the end of 1997, most economies in East Asia are expected to experience a general pick up in economic growth, underpinned by stronger exports, as a result of stronger demand from industrialised economies, including improved semiconductor sales. The recent depreciation of several East Asian currencies will help to improve export competitiveness and should lead to stronger exports provided the boost to competitiveness is not lost through higher ongoing inflation.

Chart 2: East Asia, GDP growth and inflation (through-the-year, percentage change)



e = estimate and f = forecast

The weakness in exports and economic growth in 1995–96 and 1996–97 revealed economic problems in some economies which had previously been masked by high growth rates, strong investment and high corporate profitability. While activity in the region is expected to pick up in 1997–98, these problems, which are outlined below, suggest that there are significant downside risks surrounding the forecast improvement.

First, the need for reform of the financial sector and for appropriate prudential and regulatory arrangements in many of the countries has been highlighted. The slowdown in economic growth and falling asset prices has increased the number of non-performing loans in some economies. Underpinning the forecast pick up in exports and GDP growth in 1997–98 is the expectation that this issue will be resolved in the period ahead, including through the use of supportive policies. To the extent that this does not happen, the capacity of affected financial institutions to lend for new investment would be impaired, adversely affecting the outlook for economic activity.

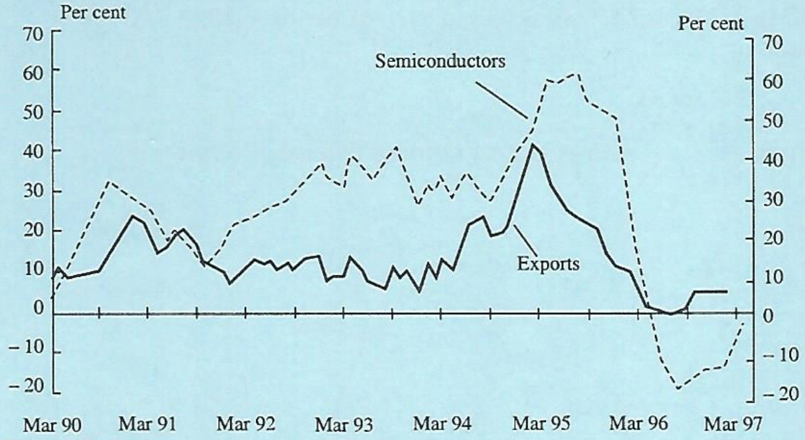
Secondly, the weakness in exports and economic growth has focussed attention on the need for sound macroeconomic policies and the difficulties associated with setting macroeconomic policies in the face of capital flow surges. Several countries have recently increased interest rates significantly in an attempt to support their external position. If maintained, these higher rates could weaken their growth outlook. Action to tackle underlying problems, including in respect of financial sectors, would help to allow lower interest rates. There are reasonable prospects that this will occur.

In particular, recent developments have shown the difficulties that can be encountered in trying to maintain a fixed nominal exchange rate that is not supported by economic fundamentals. Recent decisions by some countries in East Asia to allow greater exchange rate flexibility are, overall, positive developments that are likely to help underpin a pick up in export growth. However, simply allowing greater exchange rate flexibility is rarely a panacea and the forecasts are based on the expectation that introducing greater exchange rate flexibility will not be used as a replacement for addressing fundamental economic policy problems. Greater exchange rate flexibility can help policymakers to address those fundamental issues by removing the sense of crisis that can surround a fixed exchange rate when it is under pressure.

Box 2: Developments in East Asian exports

After recording strong export-led growth during the first half of the 1990s, economic growth in East Asia slowed in 1995–96 and 1996–97. This was, in part, thew result of a region-wide easing in nominal export growth[4] (see Chart B2). While the decline in nominal export growth was widespread, the depth and length of the slowdown varied across the region.

Chart B2: Growth in East Asian export earnings and in the value of semiconductor sales (through-the-year, 3 month moving average)



Source: Datastream.

The region-wide decline in nominal export growth reflected a number of factors, including:

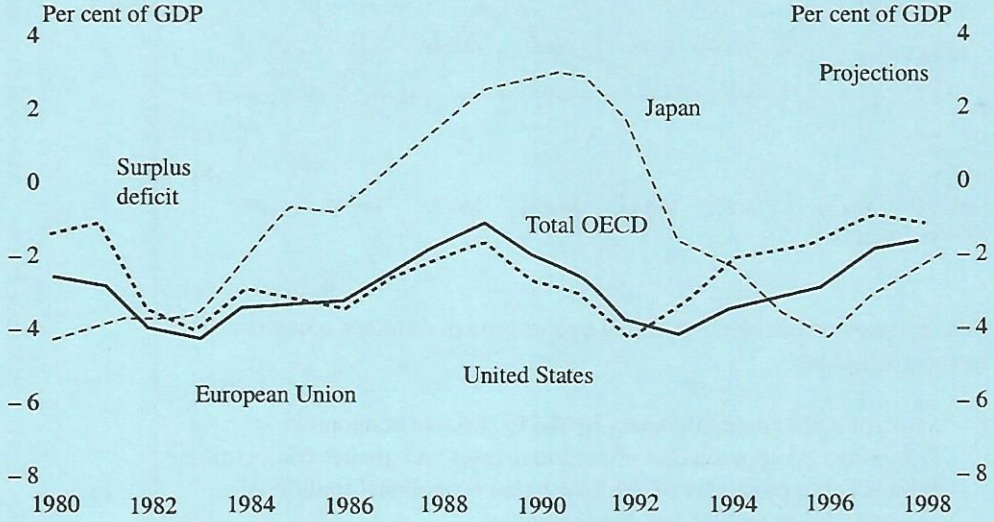
- a loss of price competitiveness by the East Asian economies, following real appreciation of exchange rates and greater competition from cheaper producers of the East Asian economies' traditional exports such as textiles and food products;
- slower growth in global demand and a fall in Asian import penetration to the US;
- significant intra-regional trade links, with Hong Kong and Taiwan being particularly affected by China's slowing during early 1996; and
- a global oversupply in some goods, notably semiconductors. Singapore and South Korea's large semiconductor industries, in particular, were adversely affected in 1996 when unexpected weaker demand and over production resulted in DRAM (Dynamic Random Access Memory) chip prices falling by over 80 per cent. Semiconductor producers responded to the price reductions by reducing production. As a result, the value of East Asian semiconductor sales contracted for much of 1996 and through the first two months of 1997. It is expected that a run down in inventories, combined with the transition to new computer products, should help the recovery in the East Asian semiconductor industry during the year ahead.

So far in 1997 most East Asian economies have recorded some recovery in export growth, albeit to varying degrees. China and the Philippines have recorded strong export growth, while in economies which rely significantly on the electronics sector—such as Singapore and South Korea—the pick up has been slower.

Fiscal policy

Along with the general decline in inflation over recent years, there has been a major shift toward fiscal consolidation in most OECD countries. Nearly all OECD countries are undertaking consolidation and many have made significant progress. Fiscal positions deteriorated in most industrialised economies in the early 1990s, unwinding the substantial reduction in fiscal deficits achieved over the period 1983 to 1989 (see Chart 3).

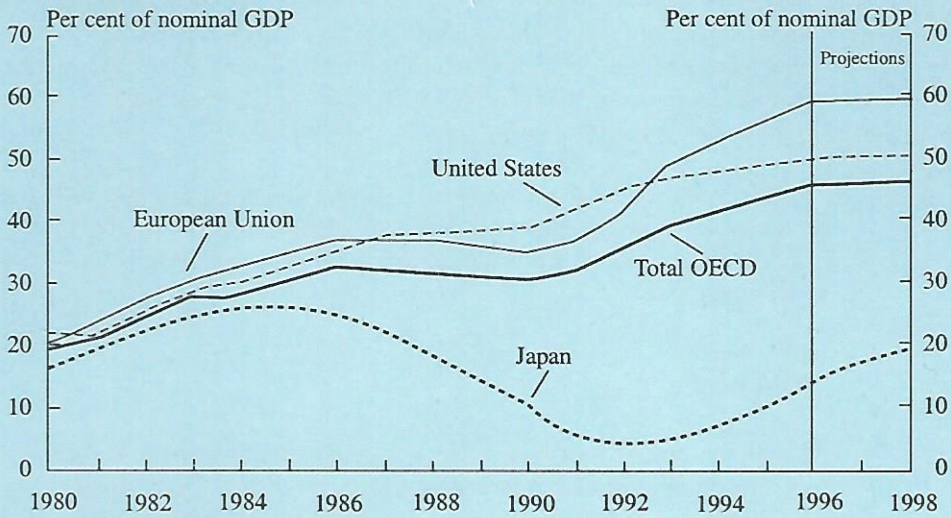
Chart 3: General government financial balances



Source: OECD Economic Outlook, June 1997.

Since the early 1990s, fiscal positions across the OECD have generally improved, largely reflecting specific fiscal consolidation measures. The latest OECD Economic Outlook projects a continued improvement in the fiscal positions of most member countries in 1997 and 1998, which, as can been seen in Chart 4, is expected to result in general government net financial liabilities for the OECD region broadly stabilising relative to GDP.

Chart 4: General government net financial liabilities



Source: OECD Economic Outlook, June 1997.

Fiscal policy outlook

In view of the risks associated with debt accumulation and the growing pressure that most industrialised countries will face from their ageing populations, there is now widespread commitment across the OECD area to take further action to improve fiscal positions over the medium term.

Many countries have established plans to implement substantial fiscal consolidation programs over the coming years.

- Within Europe, many countries have announced plans for further fiscal consolidation to underpin their participation in the European Monetary Union (EMU).
- Japan introduced significant fiscal stimulus in the early to mid 1990s to assist recovery from recession. In 1996, the Japanese Government announced that this stimulus would be wound back, and that the combined deficit of the central and local governments would be more than halved as a proportion of GDP by early next century.
- The US has outlined a medium-term objective of balancing the Unified Federal Budget by 2002. In order to achieve this, considerable focus will need to be brought on welfare entitlement programmes.

Over the medium term, implementation of the announced fiscal consolidation plans will help to raise sustainable rates of economic growth and living standards.

In the short term, the impact on economic growth of fiscal consolidation is less clear. In some countries where economic growth has been relatively weak, such as Japan and many countries in Europe, some have argued that the degree of fiscal consolidation being undertaken may adversely affect their growth prospects.

However, international experience[5] suggests that fiscal consolidation can have positive effects on economic growth. This is because the direct impact on activity from lower government expenditure may be offset by higher private expenditure generated by lower interest rates, possibly reflecting lower risk premia and less demand for funds from the public sector. In addition, transfers of functions from the public to the private sector should not reduce total activity and may increase demand by increasing efficiency and reducing prices. On the other hand, the benefits of consolidation may be smaller in economies with other structural rigidities which impede growth of the private sector.

In that context, the benefits of fiscal consolidation in Europe may be reduced to the extent that consolidation is not accompanied by structural reform and to the extent that consolidation reflects revenue rather than expenditure measures.

End notes

1 In this article, East Asia is taken as comprising Indonesia, Malaysia, the Philippines, Singapore, Thailand, South Korea, Hong Kong, Taiwan and China.

2 In this article, North East Asia is taken as comprising South Korea, Hong Kong, Taiwan and China.

3 Developing countries refers to non-oil producing developing countries as defined by the IMF.

4 Nominal exports rather than real exports are used because region-wide data on export volumes are unavailable.

5 World Economic Outlook, May 1996 and OECD Economic Outlook, June 1996.

Source: *Economic Roundup*, The Commonwealth Treasury of Australia, Winter 1997, pp. 15–25.

National income determination

Topic 5

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Suggested answers

Introduction

In Topic 4, measurement of the principal aggregate variables that make up the economy was described. We now try to explain how and why these variables fluctuate. In many ways, the explanations are based on the microeconomic principles already presented in earlier topics, such as household demand, and the firm's production and investment decisions.

The circular flow model in topic 4 showed how payments flow among the four sectors of the economy—households, firms, government and foreign sector—and how these sectors interact through three markets—product market, labour market and financial market. We shall start with a very simple model of the product market and develop a basic macroeconomic theory of income determination. We break down aggregate demand into its component parts—consumption, investment, government expenditure, imports and exports. We then analyse the behaviour of each part to gain a clearer understanding of what causes aggregate demand to fluctuate. In this way we can identify the forces which make GDP grow, sometimes at a rapid rate, sometimes very slowly and sometimes not grow at all. This is important to managerial decision makers who have to base their production and investment decisions on profit expectations and confidence about future levels of economic activity.

Objectives

At the end of this topic you should be able to:

- describe the components of aggregate demand;
- explain what determines aggregate demand;
- explain the sources of growth and fluctuations in aggregate demand;
- define macroeconomic equilibrium;
- interpret the macroeconomic model of income determination.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 21, 22, 25.

Income determination

There is a particular level of output which the economy can sustain in the long run. This 'natural' or 'potential' level of output may change if the factors of production increase or as a result of technical advance.

Macroeconomics examines why actual output deviates from this potential output in the short run.

What determines the level of economic activity in the economy at any particular time? The actual level of output depends on the level of *aggregate demand,* which is the total amount that people want to spend on goods and services in the economy as a whole.

As Begg et al. (2000) point out, this *demand determined* model of output and employment was first developed by John Maynard Keynes in 1936. Although subject to much debate since then, the Keynesian theory of income determination is a useful approach to macroeconomic analysis. In this approach it is argued that the strength of *aggregate demand* influences the performance of the economy. When aggregate demand is growing, the economy is likely to be booming, with inflationary pressures building up. When aggregate demand stagnates, a recession, associated with high unemployment, is likely to follow. We can determine an *equilibrium* level of income, i.e. a level of income where planned aggregate spending just equals the output that is actually produced. The determination of this equilibrium level of income can be graphically illustrated with an income/expenditure diagram—refer to figures 21-1, 21-2, 21-4 and 21-5 in Begg et al. (2000), pp. 349–52.

Aggregate output and income (*Y*)

Real gross domestic product (GDP) is a measure of the quantity of output produced in the economy and includes the production of services, consumer goods, and investment goods. The variable *Y* is used to refer to both *aggregate output* and *aggregate income* because they are the same thing seen from two different perspectives. When output increases, additional income is generated: workers may be paid more, owners may earn more profits. There is an exact equality between aggregate output (production) and aggregate income. We use the combined term *aggregate output (income)* to refer to the aggregate quantity supplied by firms.

Aggregate demand (AD)

We now look at real GDP from the expenditure side. Aggregate demand is the amount that all economic decision makers plan to spend on goods and services at each level of income, assuming constant prices. The four components of aggregate demand which reflect the four sectors of the economy are:

- Consumption.
- Investment.
- Government expenditure.
- Net exports (exports-imports).

In Topic 4 we included a table (Table 4.2) showing each of the components of aggregate demand at current prices and at constant 1989–90 prices. The following table shows the change in each component of aggregate demand over the financial years from 1988–89 to 1996–97, and the contribution of each to annual growth of GDP at constant prices.

Note the way some components have fluctuated more than others over this period.

Table 5.1: Expenditure on gross domestic product at average 1989–90 prices (a)

	Final consumption expenditure		*Gross fixed capital expenditure*							
Period	*Private*	*Government*	*Private*	*Public enterprises*	*General government*	*Increase in stocks*	*Statistical discrepancy*	*Exports of goods and services*	*Imports of goods and services*	*GDP (I) income based*
				ANNUAL ($ MILLION)						
1988-89	209,062	59,540	70,943	11,031	7,873	3,698	4,162	57,459	63,646	360,123
1989-90	218,318	61,482	67,817	13,128	8,638	5,202	3,232	60,625	67007	371,431
1990-91	220,424	63,132	59,874	11,857	8,688	- 1,169	1,720	67,623	63,409	368,739
1991-92	226,400	65,106	56,639	11,465	8,827	- 2,319	- 3,800	73,730	65,800	370,248
1992-93	233,317	66,071	61,116	9,903	9,277	676	- 5,217	78,194	70,746	382,591
1993-94	241,178	67,367	66,492	9,256	8,959	989	- 2,485	85,908	76,214	401,451
1994-95	253,544	69,666	73,259	11,147	9,343	2,254	2,026	89,555	89,957	420,838
1995-96	263,754	71,743	76,257	10,438	9,347	1,664	332	99,254	95,525	437,264
1996-97	269,954	72,844	85,515	8,983	9,702	- 2,186	3,811	109,257	107,298	450,575
				PERCENTAGE CHANGE FROM PREVIOUS YEAR						
1988-89	4.2	2.0	14.2	- 1.1	- 3.5	na	na	1.3	23.9	4.0
1989-90	4.4	3.3	- 4.4	19.0	9.7			5.5	5.3	3.1
1990-91	1.0	2.7	- 11.7	- 9.7	0.6			11.5	- 5.4	- 0.7
1991-92	2.7	3.1	- 5.4	- 3.3	1.6			9.0	3.8	0.4
1992-93	3.1	1.5	7.9	- 13.6	5.1			6.1	7.5	3.3
1993-94	3.4	2.0	8.8	- 6.5	- 3.4			9.9	7.7	4.9
1994-95	5.1	3.4	10.2	20.4	4.3			4.2	18.0	4.8
1995-96	4.0	3.0	4.1	- 6.4	0.0			10.8	6.2	3.9
1996-97	2.4	1.5	12.1	- 13.9	3.8			10.1	12.3	3.0
				CONTRIBUTION TO ANNUAL GROWTH						
1988-89	2.4	0.3	2.5	0.0	- 0.1	0.9	1.3	0.2	- 3.6	4.0
1989-90	2.6	0.5	- 0.9	0.6	0.2	0.4	- 0.3	0.9	- 0.9	3.1
1990-91	0.6	0.4	- 2.1	- 0.3	0.0	- 1.7	- 0.4	1.9	1.0	- 0.7
1991-92	1.6	0.5	- 0.9	- 0.1	0.0	-0.3	- 1.5	1.7	- 0.6	0.4
1992-93	1.9	0.3	1.2	- 0.4	0.1	0.8	- 0.4	1.2	- 1.3	3.3
1993-94	2.1	0.3	1.4	- 0.2	- 0.1	0.1	0.7	2.0	- 1.4	4.9
1994-95	3.1	0.6	1.7	0.5	0.1	0.3	1.1	0.9	- 3.4	4.8
1995-96	2.4	0.5	0.7	- 0.2	0.0	- 0.1	- 0.4	2.3	- 1.3	3.9
1996-97	1.4	0.3	2.1	- 0.3	0.1	- 0.9	0.8	2.3	- 2.7	3.0

(a): Implicit price deflators and fixed-weighted price indexes are in the Prices chapter. *Source: Australian National Accounts: National Income, Expenditure and Product* (5206.0).

Source: ABS (1998), April, p. 21.

Consumption

Consumption represents the level of expenditure by households and individuals on goods and services. Personal consumption expenditure can be divided into three main categories: durable goods (e.g. cars, furniture, household appliances), non-durable goods (e.g. food, clothing, petrol, cigarettes), and payments for services (e.g. hospitals, theatres, restaurants, public transport).

Tables 5.2A and 5.2B show the key items of consumption expenditure and it is clear that they are all relatively stable (particularly when compared to investment in the previous table). Note which items of consumption expenditure have the greatest variability.

Table 5.2A: Private final consumption expenditure at average 1989–90 prices

Period	*Food*	*Cigarettes and tobacco*	*Alcoholic drinks*	*Clothing, footwear and drapery*	*Household appliances*	*Other household durables*	*Health*	*Dwelling rent*	*Gas, electricity and fuel*
ANNUAL ($MILLION)									
1988-89	30,960	4,037	9,111	13,093	5,914	8,624	14,402	39,031	4,386
1989-90	31,624	3,978	9,329	12,914	6,702	8,672	14,921	40,479	4,660
1990-91	32,348	3,873	9,378	12,547	6,657	8,356	15,369	41,706	4,746
1991-92	33,292	3,635	9,294	13,049	6,778	8,881	16,100	42,819	4,794
1992-93	34,297	3,381	9,255	13,147	7,127	9,177	16,902	44,111	4,974
1993-94	35,469	3,135	9,723	13,486	7,826	9,429	17,629	45,586	4,954
1994-95	37,553	2,963	10,241	14,051	8,556	9,707	18,512	47,230	5,218
1995-96	39,662	2,801	10,365	14,379	9,128	9,896	19,297	48,660	5,329
1996-97	39,740	2,681	10,098	13,976	9,807	9,792	19,609	49,872	5,441
PERCENTAGE CHANGE FROM PREVIOUS YEAR									
1988-89	- 0.7	- 1.0	0.7	0.5	7.1	3.9	6.1	3.6	2.5
1989-90	2.1	- 1.5	2.4	- 1.4	13.3	0.6	3.6	3.7	6.3
1990-91	2.3	- 2.6	0.5	- 2.8	- 0.7	- 3.6	3.0	3.0	1.8
1991-92	2.9	- 6.2	- 0.9	4.0	1.8	6.3	4.8	2.7	1.0
1992-93	3.0	- 7.0	- 0.4	0.8	5.1	3.3	5.0	3.0	3.7
1993-94	3.4	- 7.3	5.0	2.6	9.8	2.7	4.3	3.3	- 0.4
1994-95	5.9	- 5.5	5.3	4.2	9.3	2.9	5.0	3.6	5.3
1995-96	5.6	- 5.5	1.2	2.3	6.7	1.9	4.2	3.0	2.1
1996-97	0.2	- 4.3	- 2.6	- 2.8	7.4	- 1.1	1.6	2.5	2.1

Table 5.2B: Private final consumption expenditure at average 1989–90 prices (cont.)

Period	*Fares*	*Purchase of motor vehicles*	*Operation of motor vehicles*	*Postal and telephone services*	*Entertainment and recreation*	*Financial services*	*Other goods*	*Other services*	*Net expenditure overseas*	*Total*
ANNUAL ($ MILLION)										
1988-89	5,656	7,898	13,758	2,995	10,051	7,552	14,000	18,559	- 966	209,062
1989-90	5,847	9,149	14,053	3,245	10,253	8,282	15,096	19,475	- 362	218,318
1990-91	6,446	8,609	13,948	3,402	10,672	8,463	15,235	19,723	- 1,054	220,424
1991-92	7,125	8,061	14,335	3,734	11,004	8,256	16,271	20,810	- 1,837	226,400
1992-93	7,368	8,632	14,698	4,222	11,542	8,627	16,670	21,825	- 2,638	233,317
1993-94	7,302	8,631	15,135	4,703	12,303	9,383	17,393	22,955	- 3,863	241,178
1994-95	7,837	9,536	15,480	5,139	13,370	9,912	18,556	24,580	- 4,899	253,544
1995-96	8,267	9,750	15,482	5,843	14,340	10,182	19,630	26,228	- 5,486	263,754
1996-97	8,553	10,645	15,617	6,370	15,049	10,747	19,734	27,736	- 5,513	269,954
PERCENTAGE CHANGE FROM PREVIOUS YEAR										
1988-89	2.4	22.1	1.7	7.3	3.3	9.8	8.3	7.5	na	4.2
1988-90	3.4	15.8	2.1	8.4	2.0	9.7	7.8	4.9		4.4
1990-91	10.2	- 5.9	- 0.7	4.8	4.1	2.2	0.9	1.3		1.0
1991-92	10.5	- 6.4	2.8	9.8	3.1	- 2.4	6.8	5.5		2.7
1992-93	3.4	7.1	2.5	13.1	4.9	4.5	2.4	4.9		3.1
1993-94	- 0.9	0.0	3.0	11.4	6.6	8.8	4.3	5.2		3.4
1994-95	7.3	10.5	2.3	9.3	8.7	5.6	6.7	7.1		5.1
1995-96	5.5	2.2	0.0	13.7	7.3	2.7	5.8	6.7		4.0
1996-97	3.5	9.2	0.9	9.0	4.9	5.5	0.5	5.8		2.4

Source: ABS (1998), May, pp. 36–7.

Consumption is the biggest component of aggregate demand and has ranged between 57 and 63 per cent of GDP in Australia over the last 30 years (McTaggart et al. 1996, p. 587). In June 1997, consumption represented 60.5% of GDP.

Investment

Investment is probably the most volatile component of aggregate demand and as such, one of the most difficult to predict. It has been as low as 14 per cent of aggregate demand, or as high as 21 per cent (McTaggart 1996, p. 587). Investment in economic terms represents expenditure on plant and machinery, equipment and construction, and these expenditures influence the productive capacity of the firm. Inventories of unsold production or partly finished goods are also classified as investment as was shown in Topic 4. Investment does not include speculation on the stock market or in land nor does it mean putting money in 'investment' accounts (which is savings). The principal factor in determining whether an action by a firm is classed as investment or not, is whether the productive capacity of the firm is affected. (N.B. In this simple model, households and individuals do not invest, they consume or save; firms invest).

It is necessary to distinguish different types of investment.

- During a given time period the value of existing machinery will depreciate with accumulated wear and tear, and obsolescence. Consequently, an allowance must be made for this replacement investment (i.e. depreciation), if we want to measure the real addition to productive capacity.

- *Net investment* refers to the purchase of new capital items which add to existing capital stock (net investment = gross investment—depreciation). Net investment is a useful concept because it tells us how much the capital stock has changed during the period. The relationship between the capital stock and net investment is:

  Capital stock, end of period = *Capital stock, beginning of period*

  + *net investment*

- Planned investment may differ from actual investment due to planned levels of production not matching actual expenditure over a period. If expenditure is less than production, there will be an unplanned increase in inventories. Inventory accumulation, you will recall, forms part of investment expenditure. We want to measure all that the economy has produced each period so we cannot exclude inventories. *Actual investment* refers to planned investment plus or minus the change in inventories.

Government

Government expenditure encompasses the public sector of the economy. There are three levels of government in Australia, Commonwealth, State and Local, so government expenditure covers a wide range of public sector activities. It is relatively stable and

☐ *Read sections 4-1 and 4-2 in Begg et al. (2000), pp. 43–49.*

As you can see from the reading, Government plays a major role in a modern mixed economy like Australia. In terms of expenditure, the share of government activity in national income has been rising until the 1990s in many market economies, including Australia and Britain. This has been true even in market economies where there have been attempts by the public sector to disengage itself from economic involvement through privatisation and asset sales.

Government expenditure covers the establishment and maintenance of institutional frameworks for the community, the provision of a range of non-market (public) goods and services, and the administration of income transfers. It includes both government consumption expenditure and government investment expenditure. State and local governments account for more than two-thirds of total government expenditure, whereas the Commonwealth government raises most of the taxation revenue.

Net exports (foreign sector)

The final component of aggregate demand is *net exports* and this refers to the expenditure by foreigners on Australian-made goods and services minus the expenditure by Australian residents on foreign-made goods and services. Net exports is the smallest component of aggregate demand and it fluctuates between 1 and – 4 per cent of GDP (McTaggart et al. 1996, p. 587).

Question 5.1

Using Table 5.1, calculate the % contribution of consumption, investment, government expenditure and net exports to GDP in 1990–91 and in 1995–96. Compare and contrast the two figures.

(N.B. For consumption just use the figure for private final consumption expenditure. For Investment, use the figures for private gross fixed capital expenditure plus the figure for public enterprises and the figure for increase in stocks. For Government, use the Government consumption figure plus general Government capital expenditure. For net exports use the figures for exports minus the figures for imports.)

Macroeconomic equilibrium

The equilibrium level of output is the output whose production will actually create total spending power just sufficient to purchase that output. This is the only level of output at which people are willing to spend precisely the amount necessary to take the output off the market. The annual rates of production and spending are in balance. There is no overproduction and no piling up of unsold stocks. There is no excess spending and inventories are not being run down. This is the *aggregate expenditure-aggregate income approach* to equilibrium.

Initially, we can look at this equilibrium situation in a simple two-sector economy (only households and firms), and equilibrium can be indicated on a 45^0 diagram. In this graph, a 45^0 line is drawn and any point on this line corresponds to the same dollar magnitude on either axis. It serves then as a useful reference for interpreting the relationship between disposable income and aggregate expenditure. When the aggregate demand schedule is drawn on this diagram, the point of intersection with the 45^0 line is the only point at which income and desired spending are equal.

☐ *Read Section 21-4 in Begg et al. (2000), pp. 351–3, and particularly note Figure 21-5.*

In the other approach to equilibrium, the *leakages-injections approach*, saving represents a leakage, or a withdrawal of potential spending, from the income-expenditure stream, and investment represents an injection. Due to saving, consumption falls short of aggregate output. By itself consumption is insufficient to absorb all the production. But, the business sector did not intend to sell its entire output to consumers; some of the output will take the form of investment goods that will be sold within the business sector. Investment can therefore be thought of as an injection of spending into the income-expenditure stream that supplements consumption. Investment is an offset to the leakage of saving. At equilibrium, savings equals investment. A leakages-injections graph can also be drawn to show the equilibrium level of income. Equilibrium is that level of income at which households plan to save as much as firms are planning to invest.

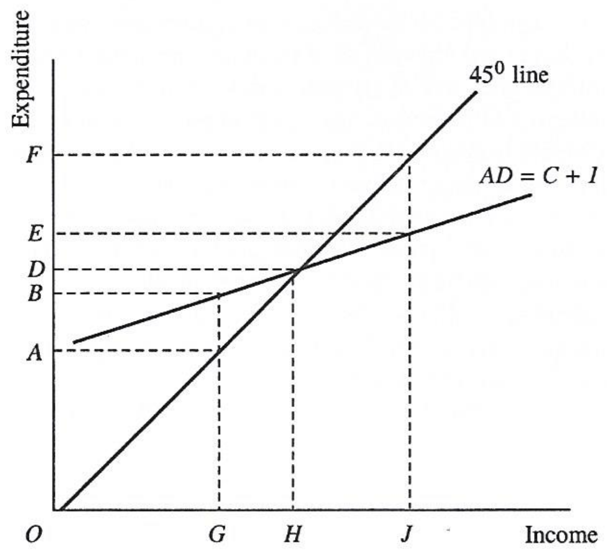
☐ *Read Section 21-5 in Begg et al. (2000), pp. 353–4. Note the equilibrium Point E in Figure 21-6.*

According to the income-expenditure approach, the equilibrium level of total income output and employment occurs where the aggregate demand line intersects the 45° line. At equilibrium the total income earned from production of the economy's total output corresponds to a level of total spending just sufficient to purchase that total output. Although this is a theoretical construct, it is evident in real world situations. If total income (output) is less that the equilibrium level, planned total spending is greater than total output and there is an unintended reduction in inventories. This leads the economy's business firms to increase total output, so that total income and employment rise towards the equilibrium level. The opposite occurs if planned total spending is less than total output and there is an unintended increase in inventories. Realised investment is always equal to saving. Planned investment equals saving only at the equilibrium level of total income. Therefore, planned investment and realised investment are equal at the equilibrium level of total income but differ from each other by the amount of unintended inventory change at all other levels of total income.

According to the leakages-injections approach, the equilibrium level of income occurs where saving equals investment. If the leakage due to saving is less than the injection from intended investment, the economy is not in equilibrium. Total income needs to rise towards the equilibrium level or the level of investment may decline. If households save more, consumption demand must fall. In the long run, these adjustments may occur—reduced consumption, and increased savings, finances the level of investment.

Question 5.2

The following diagram shows the aggregate demand schedule for a simple two-sector economy, together with the 45⁰ line.



(a) Suppose output is OG. Identify the level of aggregate demand and specify whether there is excess demand or excess supply.

(b) What is the size of the unplanned inventory change with output OG?

(c) How will firms respond to this situation?

(d) Identify equilibrium income and expenditure.

(e) Suppose output is OJ. Identify the level of aggregate planned expenditure and specify whether there is excess demand or excess supply.

(f) What is the size of the unplanned inventory change with output OJ—and how will firms react to it?

We will now look at each component of aggregate demand in detail, explain the relationship of each to the level of income, and show how each one fluctuates. We shall then be in a position to broaden our simple model into a complete macroeconomic model including all sectors and markets. This discussion of the components of aggregate demand (AD) shows what we inherently know about each one and what determines the size of each component relative to GDP.

Consumption

The most important determinant of consumption is income. On average, households with higher incomes spend more. What they do not consume, they save. Households with higher incomes also save more.

Factors other than income may affect aggregate consumption. Household wealth is important. Households may hold their wealth in many different forms—savings accounts at the bank, government bonds, shares, property, other valuable assets such as jewellery or antiques. Some economists have suggested that consumption is based on average long-run income. People form notions about their likely income and form a feasible consumption pattern in response. This means they may not be affected by changes in income which they perceive as temporary, or by the fact that their income varies at different parts of their lives.

☐ *Read Section 21-2 (pp. 349–51) and Section 25-1 (pp. 407–11) in Begg et al. (2000).*

Determinants of consumption

The volume of consumption expenditure by individuals in any given period is determined by many factors including:

- disposable income (gross income minus tax);
- expected future income;
- household wealth;
- interest rates;
- stock of durables;
- cost and availability of consumer credit.

Question 5.3

From your own experience, do you think the above factors are important in influencing your consumption decisions or are there other influences? If so, what are these other factors?

The relationship between income, consumption and savings

It is generally considered that disposable income is the most important influence on the level of spending. Disposable income is national income minus taxation. By assuming all other factors constant (ceteris paribus), we can study the relationship between consumption and income in more detail.

The consumption function and the savings function

Disposable income (YD) is divided between what you consume (C) and what you save (S). The relationship between consumption and income is called the *consumption function* and may be expressed as:

$$C = f(YD) \qquad (5.1)$$

Likewise, the relationship between savings and income is called the *savings function* and may be expressed as:

$$S = f(YD) \qquad (5.2)$$

These relationships may be graphed with *YD* (the independent variable) on the horizontal axis, and *C* or *S* (the dependent variable) on the vertical axis.

☐ *Refer to figures 21-2 and 21-3 in Begg et al. (2000), p. 350.*

The *consumption function* can be more fully expressed as:

$$C = Co + c\,(YD) \qquad (5.3)$$

where C_o is the *autonomous* consumption required, regardless of income level (see Begg et al. 2000, p. 350; it is the value of the *y* intercept). *c* is the slope or gradient of the function and this indicates the extent to which consumption changes as disposable income changes.

The *savings function* can be more fully expressed as:

$$S = So + s\,(YD) \qquad (5.4)$$

where *So* refers to the level of dissavings when personal disposable income is zero. *s* is the slope or gradient of the function and indicates the extent to which savings increases as income increases.

The average and marginal propensities to consume and save

Economists use the term *propensity to consume* to describe the tendency to spend as income changes. The propensity (or tendency) to consume may be either an average or marginal measurement.

The *average propensity to consume* indicates the average level of consumption which is undertaken at a certain income level. This may be written as:

$$APC = C/YD \qquad (5.5)$$

The *APC* declines as income rises highlighting the fact that people on high incomes save a greater proportion of their earnings than people on low incomes.

Given the hypothesis that anything that is not consumed is saved, we may also calculate the *average propensity to save* (*APS*). This may be written as:

$$APS = S/YD \qquad (5.6)$$

The relationship between the *APC* and *APS* should be clear.
If $YD = C + S$, i.e. all income is either consumed or saved, then the $APC + APS = 1$, because

$$C/YD + S/YD = YD/YD = 1. \qquad (5.7)$$

The *marginal propensity to consume* illustrates what happens to consumption when income changes. It shows the proportion or fraction of any change in income which is consumed and is calculated as follows

$$MPC = \Delta C/\Delta YD \qquad (5.8)$$

(Δ means 'change in')

The MPC is the slope of the consumption function and is indicated by the coefficient on YD in equation 5.3.

The *marginal propensity to save* is calculated in a similar fashion.

$$MPS = \Delta S/\Delta YD \qquad (5.9)$$

The MPS is the slope of the savings function and is indicated by the coefficient on YD in equation 5.4.

Again, the relationship between the MPC and MPS should be clear. If $\Delta YD = \Delta C + \Delta S$, i.e. all extra income is either consumed or saved, then $MPC + MPS = 1$, because

$$\Delta C/\Delta YD + \Delta S/\Delta YD = \Delta YD/\Delta YD = 1. \qquad (5.10)$$

In this section, we have concentrated on two of the key concepts of the Keynesian theory of income determination—the consumption function and the savings function. Consumption demand (and therefore savings) is closely related to personal disposable income and is significantly affected by changes in wages and salaries, as well as changes in taxes and transfer payments. Consequently business decision makers need to be aware of changes, or potential changes, in personal disposable income because it will affect the demand for their products.

The marginal propensity to consume is the fraction by which consumption rises when income rises by one unit. (This is represented graphically by the slope of the consumption function). The significance of this concept is the fact that it determines the extent to which any changes in income will translate into consumption expenditure. The marginal propensity to save can be interpreted in the same way.

Other influences on consumption and saving, apart from disposable income, will cause the consumption and saving functions to move to the right or left (i.e. increase or decrease). Such things as credit conditions, consumer wealth and consumer expectations about unemployment, prices and income will affect the amount of consumption expenditure, or saving, households are willing to undertake.

☐ *Read Section 21-8 in Begg et al. (2000), pp. 357–8.*

Changes in factors other than disposable income influence consumption expenditure because they influence autonomous consumption expenditure. Changes in such factors as wealth, interest rates, expected future income, shift the intercept in both the consumption function and the savings function (Co and So in equations 5.3 and 5.4 above). Any shift in the consumption function will shift aggregate demand and the equilibrium level of output will change.

A change in the amount households wish to save will result in a change in the equilibrium level of output but no change in the equilibrium level of planned investment. For example, if households want to save less, then higher output will be need to offset the reduced desire to save at each output level, so that planned savings will still equal planned investment. Alternatively, if society attempts to save more, there will be a decline in the equilibrium level of GDP, and there will be increased saving at each output level. This increased saving will equal the planned investment.

☐ *Refer to figures 21-8 and 21-9 in Begg et al. (2000), p. 357.*

Question 5.4

The consumption function for a hypothetical, closed economy with no government sector, is

$$C = 400 + 0.75\,YD$$

(a) What is the level of autonomous consumption?

(b) What is the marginal propensity to consume?

(c) Calculate the level of planned consumption if YD = 2,000

(d) Derive the savings function.

(e) What is the marginal propensity to save?

(f) Calculate the level of planned savings if YD = 2,000

The multiplier effect

A change in any autonomous spending (such as autonomous consumption—*Co*) will shift the aggregate demand schedule to a new equilibrium position. Following such a change, it can be observed that the change in equilibrium output is larger than the original change in autonomous spending which initiated the change. This is because the change in income itself induces further changes in spending through what is known as the *multiplier process*.

☐ *Read Section 21-7 in Begg et al. (2000), pp. 356–7.*

The multiplier tells us how much output changes when there is a shift in aggregate demand. It is the ratio of the change in equilibrium GDP to the change in autonomous spending that caused the change in output.

$$\text{multiplier} = \frac{\text{change in real GDP}}{\text{change in spending}}$$

The change in spending can be a change in any one of the autonomous components of aggregate demand, i.e. autonomous consumption, investment, government purchases, or exports, and it will result in a shift upwards or downwards of the aggregate demand line in the income/expenditure diagram. The multiplier is based on the fact that there are repetitive and continuous flows of expenditure and income within the economy because one person's expenditure is another person's income. This means that any change in income will bring about a change in both consumption and saving. Consequently, an initial change in the rate of spending will cause a chain reaction that, although it gets smaller at each step, will ultimately lead to a multiple change in GDP (McConnell et al. 1994, p. 249).

The multiplier is determined by the marginal propensity to consume. It is greater than one because the changes in autonomous expenditure induce further increases in expenditure. The extent to which this occurs depends on the magnitude of the *MPC*. Alternatively, it can be stated that the multiplier effect is limited by the extent to which people save their extra income.

The formula for the simple multiplier is expressed as:

$$\text{multiplier} = \frac{1}{MPS} \text{ or } \frac{1}{1-MPC} \quad (5.11)$$

From an economic policy viewpoint, the *MPC* and the *MPS* are important because they enable us to determine the likely effect of certain policy changes. If, as a result of changes in government expenditure or taxation, there is a change in disposable income, the *MPC* and the *MPS* indicate what will happen to the general pattern of spending and saving. For example, if the *MPC* is high, the multiplier effect of a change in direct taxes is significant. If the *MPS* is high, the multiplier effect of a change in government expenditure may be minimal.

Question 5.5

(a) What will the multiplier be if the MPC is 1, 9/10, 2/3, or 1/2?

(b) By how much will GDP change if businesses increase their level of investment by $8 billion and the MPC is 4/5?

Question 5.6

Explain how each of the following will affect the consumption and savings functions:

(a) A decline in the amount of government bonds that consumers are holding.

(b) A sharp decline in share prices.

(c) The announcement that social security program is to be restricted in both coverage and size of benefits.

(d) The expectation that mild inflation will persist in the next decade.

Question 5.7

Explain why a shift upwards in the consumption schedule usually involves an equal downshift in the savings schedule. What is the one exception to this?

Question 5.8

Explain the meaning and significance of the 'paradox of thrift'.

The central feature of the Keynesian consumption function is that current consumption depends on current income. Keynes' approach to the question of how much people consume was to ask what factors cause people to save money. Finding out how savings are determined also shows how consumption is determined. While there are a number of factors that determine how much households will save, we can assume that these factors do not change much. Thus, the marginal propensity to save remain constant, which implies that the marginal propensity to consume stays constant as well. To predict changes in consumption from one year to another, all we need to know is the expected change in disposable income, and we multiply this change in disposable income by the marginal propensity to consume.

Other theories of consumption emphasise the importance of lifetime wealth, and the tax system, as determinants of consumption expenditure. These different theories of consumption are relevant to business managers. It can be useful to understand whether temporary tax cuts will have any effect on consumption expenditure; or whether a permanent rise in social security benefits will increase consumption or not. Similarly, we may like to know whether such factors as the age structure of the population, a stock market crash, or an increase in property prices, are going to affect consumption expenditure. Our answers to these questions will depend partly on which theory of consumption we believe is paramount.

Investment

In this section, we explore matters of investment; in particular the factors that influence investment decisions on the part of business managers.

Determinants of investment

Levels of investment are determined by a whole variety of factors including:

- interest rates;
- expected inflation;
- expected profits.

You will notice that these factors influencing investment decisions do not include the current level of income. There is not necessarily any close connection between the current level of income and the firm's decision to invest. Investment is more likely to be based on the firm's expectations about future demand for its product, expected inflation and expected profit opportunities. It is true that a higher level of economic activity may induce additional spending on capital items. As profits increase, businesses are likely to have more funds available for investment. In addition, as the level of output increases, firms are likely to be using their capital stock to full capacity and may need to add to their existing stock. Thus, it would be more exact to represent the level of investment as including both an autonomous and an induced component. However, in building our simple model, we will continue to treat investment as an exogenous (or autonomous) variable. The autonomous investment function represents the relation between income and planned investment, *ceteris paribus,* and is therefore shown as a fixed amount over all levels of income.

The following table shows the real value of the different investment categories over a 9-year period. Business fixed investment is the most volatile, varying from a reduction of 0.4% in 1989–90 to an increase of 17.4% in 1996–97. Changes in stocks (inventories) is a significant figure for it shows the difference between the level of planned investment and the level of actual investment. This occurs if the level of income (production) is not equal to the level of planned expenditure.

Table 5.3: Private gross fixed capital expenditure and stocks at average 1989–90 prices

	Private gross fixed capital expenditure						*Increase in stocks*	
		Business fixed investment						
Period	*Dwellings*	*Non-dwelling construction*	*Equipment*	*Total*	*Real estate transfer expenses*	*Total*	*Private non-farm*	*Farm and public authorities*
			ANNUAL ($ MILLION)					
1988-89	19,676	15,550	28,630	44,180	7,088	70,943	3,231	467
1989-90	18,633	16,768	27,252	44,020	5,164	67,817	2,201	3,001
1990-91	16,627	14,095	23,804	37,899	5,347	59,874	- 2,531	1,361
1991-92	16,828	11,400	22,534	33,934	5,878	56,639	- 1,647	- 672
1992-93	19,322	10,451	25,412	35,864	5,931	61,116	486	191
1993-94	21,669	10,767	27,494	38,261	6,562	66,492	1,436	- 447
1994-95	22,718	11,661	32,537	44,199	6,342	73,259	3,238	- 983
1995-96	19,833	14,418	36,249	50,667	5,757	76,257	2,512	- 848
1996-97	20,042	17,091	42,369	59,460	6,004	85,505	864	- 3,050
			PERCENTAGE CHANGE FROM PREVIOUS YEAR					
1988-89	21.0	6.8	13.9	11.3	15.2	14.2	na	na
1989-90	- 5.3	7.8	- 4.8	- 0.4	- 27.1	- 4.4		
1990-91	- 10.8	- 15.9	- 12.7	- 13.9	3.6	- 11.7		
1991-92	1.2	- 19.1	- 5.3	- 10.5	9.9	- 5.4		
1992-93	14.8	- 8.3	12.8	5.7	0.9	7.9		
1993-94	12.1	3.0	8.2	6.7	10.6	8.8		
1994-95	4.8	8.3	18.3	15.5	- 3.3	10.2		
1995-96	- 12.7	23.6	11.4	14.6	- 9.2	4.1		
1996-97	1.1	18.5	16.9	17.4	4.3	12.1		

Source: ABS (1998), May, p. 40.

Investment demand

We have identified the major factors affecting investment. We now look at some of these in more detail, particularly interest rates. The relationship between interest rates and investment can be shown by the investment demand schedule.

☐ *Read Section 25-2 in Begg et al. (2000), pp. 411–14.*

The investment demand curve can be determined by summing the amount of investment planned to be undertaken by firms at different interest rates. Projects are likely to go ahead if the expected rate of net profit is equal to, or greater than, the real interest rate. The investment demand curve can be shown graphically (refer to Figure 25-3 in Begg et al. 2000, p. 406). The graph shows that as interest rates fall, investment increases. This pattern of behaviour is because, as money becomes cheaper, the cost of investing with borrowed funds falls, and firms react accordingly. Also, as the opportunity cost of financing real investment falls, real investment becomes a much more attractive proposition than financial hoarding.

☐ *Refer to Box 25-2 in Begg et al. (2000), p. 414.*

Question 5.9

(a) Briefly explain how interest rates and business expectations influence the level of planned investment.

(b) What other factors may also influence a firm's investment decision?

In practice many observers have noted that investment demand fluctuates significantly in a manner which does not appear to be related to interest rate variations. This volatility can be explained by changes in the other factors which affect investment. The most important influence on investment decisions is business confidence, or what Keynes called the 'animal spirits' of business.

Expectations of future profits, for example, have a critical impact on the firms decision to invest.

Question 5.10

(a) In what sense is investment not determined by the current level of income?

(b) Why is there a negative relationship between demand for investment funds and the interest rate?

(c) Why does a reduction in interest rates cause the investment function to shift upwards in the expenditure-income diagram?

In our simple model of income determination we have assumed a two-sector economy (households and firms) with no government activity and no foreign trade. We now need to bring in those two sectors.

Government expenditure and revenue

☐ *Read sections 22-1 and 22-2 in Begg et al. (2000), pp. 361–4.*

Government spending on goods and services contributes directly to aggregate demand, and public enterprises also represent some of the total outlays of the government sector. This type of government expenditure is exogenous, i.e. it does not vary according to the level of output and income. It is another autonomous component of aggregate demand and is undertaken at the discretion of the government of the day. Increases in public spending, like increases in private spending, will boost aggregate demand and result in increased equilibrium GDP, due to the multiplier effect.

Governments levy taxes and make transfer payments. Because people must pay taxes, disposable income is no longer equal to real GDP. The tax function is:

$$T = To + tY \qquad (5.12)$$

where To is autonomous taxes and t is the marginal tax rate (or the marginal propensity to tax). An increase in a lump-sum tax (a change in To), shifts the consumption function (and therefore aggregate demand) downwards. The tax reduces disposable income, so consumption falls by the change in disposable income times the *MPC*. If direct tax rates are increased (a change in t), this will cause both the consumption function and aggregate demand to rotate downwards and the equilibrium level of GDP will decline.

When people receive transfer payments, it increases their disposable income. We incorporate transfer payments into our model by deducting them from taxes. Net taxes are taxes minus transfer payments. Net taxes are assumed to vary with income. If national income increases it is usually as a result of more people being employed and businesses being more profitable. Therefore households and firms will be liable to pay more tax and the government will be paying less in social security benefits (due to the reduction in unemployment).

☐ *Refer to figures 22-1 and 22-3 in Begg et al. (2000), pp. 362–3.*

Question 5.11

(a) Evaluate the following statement:

> ***'Equal increases in government spending and tax revenues of $100 billion will increase equilibrium GDP by $100 billion'.***

(b) Does this statement hold true regardless of the size of the MPS?

The government budget

Fiscal policy is the deliberate control of government spending, transfer payments and taxes in order to influence macroeconomic variables such as employment, the price level and the level of GDP. The Commonwealth Government's fiscal stance is determined by the level of expenditure and revenue in a given year and this is set out in the annual budget.

A government budget deficit occurs when government spending is greater than government revenue. A surplus arises if revenue exceeds spending. The size of the deficit, or surplus, depends upon the net tax rate, the level of spending and the level of national income.

Table 5.4 shows the financial transactions of the Commonwealth Government for 3 years and the Budget estimate for 1996–97. Note the way in which some of the outlays have varied over this period and that one of the largest items is 'not allocated to function'. Another significant figure is 'public debt interest' at more than $9 million. Under receipts, it is clear that the majority of the government's revenue comes from individual income tax. The most important item in this table is the deficit or surplus figure. Australia had a budget deficit of $11.6 billion in

1994–95, yet it budgeted for a surplus of $6.4 million in 1997–98. This means that expenditure has been cut or taxes increased by approximately $18 billion in 3 years.

Table 5.4: Financial transactions of the Commonwealth Government

($ million)

			1996/97			1997/98		
	1994/95	**1995/96**	**Oct**	**4 months to Oct**	**Full year**	**Oct**	**4 months to Oct**	**Budget estimate**
OUTLAYS								
Defence	9 731	10 011	916	3 110	9 999	748	3 147	10 405
Education	10 116	10 644	1 120	3 767	10 816	1 280	3 942	10 980
Health	17 150	18 634	1 620	6 866	19 212	1 937	7 198	20 700
Social security and welfare	43 600	46 707	4 708	16 730	49 446	4 756	17 174	50 938
Housing	1 119	1 203	168	325	963	245	284	1 147
Culture and recreation	1 262	1 413	100	529	1 320	98	542	1 319
Economic services (incl. public utilities, assistance to industry, etc.)	8 351	8 628	529	2 468	5 549	661	2 566	8 344
General public services	7 712	7 777	814	2 677	8 170	613	2 738	8 168
Not allocated to function								
- Payments to or for the states, the Northern Territory and local government authorities (not elsewhere classified)	15 068	13 798	1 488	5 674	17 466	1 268	5 654	17 053
- Public debt interest	8 005	9 126	652	3 969	9 399	734	3 726	8 920
- Other	- 54	- 1 235	2	- 3 424	- 3 832	- 283	-4 065	- 11 046
Total outlays	122 061	126 705	12 116	42 690	128 508	12 057	42 906	126 928
RECEIPTS								
Taxation revenue -								
Customs duty	3 474	3 124	268	1 058	3289	317	1 349	3 410
Excise duty	12 001	12 849	1 079	4 378	1 3291	952	4 352	13 540
Sales tax	11 624	12 955	1 135	4 356	13 308	1 137	4 501	14 170
Income tax – Individuals - Gross PAYE	50 928	56 442	4 895	20 170	61 191	5 483	21 682	65 639
- Gross other	9 481	10 078	205	1 808	11 820	204	1 886	11 140
- Gross prescribed payments	2 169	2 179	180	762	2 250	202	843	2 570
- Net individuals	54 647	60 504	4 192	17 724	66 453	4 747	18 912	69 760
- Companies	15 588	18 252	13	3 170	19 173	- 49	3 502	14 277
- Superannuation	1 913	1 634	2	283	2 595	3	417	2 490
-Withholding tax	903	1 349	96	390	1 080	95	365	1 230
- Petroleum resource rent tax	865	791	251	443	1 308	285	445	850
- Fringe benefits tax	2 740	3 031	643	1 361	3 163	639	1 341	3 150
Other taxes, fees and fines	1 953	1 960	169	530	2 145	166	632	2 243
Total taxation revenue	105 707	116 358	7 847	33 692	125 807	8 290	35 816	129 433
Interest, rent and dividends	4 725	5 302	61	2 572	5 216	64	2 100	3 918
Total receipts	110 432	121 660	7 909	36 264	131 022	8 354	37 916	133 351
Deficit (-)/Surplus (+)	- 11 629	- 5 045	- 4 208	- 6 427	2 514	- 3 703	4 991	6 423
FINANCING TRANSACTIONS								
Net overseas borrowings	- 1 246	- 900	- 300	- 322	- 241	- 98	- 186	- 6 423
Net issues of Australian Savings Bonds	- 104	. .	. .	. .	- 1	. .	. .	
Net issues of Treasury notes	- 2 022	1 136	2 306	4 509	- 1 995	702	1 297	
Net issues of Treasury indexed bonds	545	429	271	271	822	100	200	
Net issues of Treasury adjustable bonds	3 700	3 400	—	—	900	—	—	
Net issues of Treasury bonds	13 700	487	1 329	1 128	1 485	500	- 2 606	
Borrowings from Reserve Bank	—	—	—	—	—	—	—	
Use of cash balances	- 751	847	616	- 4 816	- 3 026	- 1 429	- 2 597	
Other financing transactions in Australia	- 2 192	- 353	- 14	5 657	- 458	3 928	8 883	
Total financing transactions	11 629	5 045	4 208	6 427	- 2 514	3 703	4 991	

Sources: Department of Finance, *Statement of Commonwealth Government Financial Transactions*; Budget Paper No. 1.

Source: Reserve Bank of Australia (1997), p. S80.

Table 5.5 shows the budget deficit/surplus pattern over the last decade, and the percentage of GDP it represents.

Table 5.5: Budget deficit—% gross domestic product

	Budget deficit/surplus $m	% GDP
1986/87	−2,631	0.1%
1987/88	+2,061	surplus
1988/89	+5,893	surplus
1989/90	+8,036	surplus
1990/91	+1,907	surplus
1991/92	−9,339	2.39%
1992/93	−14,571	3.56%
1993/94	−13,667	3.17%
1994/95	−11,629	2.56%
1995/96	−5,045	1.03%
1996/97	+2,514	surplus

☐ *Read sections 22-3 and 22-4 in Begg et al. (2000), pp. 364–7.*

To maintain a balanced budget, the government has to reduce spending when tax revenues fall during recessions and increase spending as revenues rise during expansions. An alternative approach is to have a cyclically balanced budget. This would mean the government would run deficits during recessions and surpluses during expansions, but over the course of the business cycle, the budget would be balanced. Yet another approach is to frame whatever budget necessary to promote economic stability and to fully utilise all available resources. With this type of budget, policy makers are indicating that they are less concerned with balancing the budget than with ensuring that the economy operates at its full potential.

Because GDP fluctuates as the economy goes through periods of expansion and contraction, actual budgets are not a good indicator of fiscal policy. The full-employment budget calculates whether the budget would be in surplus or deficit if income were at its full-employment level. This structural deficit or surplus is a better measure of the fiscal stance than the actual deficit or surplus.

Since the mid-1980s many countries have been pursuing the goal of eliminating structural deficits. Budget deficits are considered by some, to be undesirable. It is argued that if increased government expenditure is financed by increased government borrowing, then market interest rates tend to rise. These higher interest rates may discourage some private investment thus reducing the expansionary effect of the deficit.

☐ *Refer to Box 22-2 in Begg et al. (2000), p. 368.*

A further argument against budget deficits is that, with interest rates relatively high due to government borrowing, there is an increase in demand for Australian dollar denominated assets. This results in an increased demand for the Australian dollar causing it to appreciate relative to foreign currencies. Currency appreciation caused in this way may lead to an increase in the current account deficit (imports minus exports) because exports appear more expensive on world markets whilst imports are relatively cheaper on the domestic market. This twin deficit theory can be expressed in terms of the leakages/injection equation. Leakages $(S + T + M)$ equal injections $(I + G + X)$. Given that $(G - T)$ is the budget deficit and $(M - X)$ is the current account deficit, we can rewrite the equation as:

$$S + \text{current account deficit} = I + \text{budget deficit} \qquad (5.\ 13)$$

☐ *Read Section 22-6 in Begg et al. (2000), pp. 369–70.*

Depending on the assumptions one makes about the relationship between the variables in this equation, a number of different policy prescriptions can be inferred from this equation. One is that a reduction in the budget deficit will bring about a fall in the current account deficit, *ceteris paribus.*

Table 5.6 below shows the budget deficit and current account deficit over 10 years.

Does the data support this inference?

Another inference is that a rise in private savings , or an increase in public saving, will bring about a reduction in the current account deficit, *ceteris paribus*.

Table 5.6: Budget deficit and current account deficit

	Budget deficit $m	Current account deficit $m
1986/87	– 2,631	– 11,672
1987/88	+ 2,061	– 10,217
1988/89	+ 5,893	– 17,185
1989/90	+ 8,036	– 21,460
1990/91	+ 1,907	– 15,332
1991/92	– 9,339	– 11,573
1992/93	– 14,571	– 14,882
1993/94	– 13,667	– 16,655
1994/95	– 11,629	– 27,569
1995/96	– 5,045	– 20,299
1996/97	+ 2,514	– 17,875

If the government does run budget deficits it has to borrow from the public. The Commonwealth Government budget is only one part of the public sector's claim on financial markets. The impact of the public sector as a whole on the economy is measured by the *public sector borrowing requirement* which is the amount the public sector will borrow in any one year. The accumulated stock of outstanding government debt is known as the *national debt.* The size and importance of the national debt is easily exaggerated. When measuring the debt we must adjust for inflation and the effects of economic growth. We look at the size of the debt in relation to the size of GDP. If debt becomes too high relative to GDP, then higher taxation may be imposed, or interest rates increased.

Table 5.7 indicates how the budget deficit was financed during a particular year.

Table 5.7A: Commonwealth budget deficit and changes in holdings of debt

($ million)

				Domestic financing							
					Changes in holdings of debt by:						
					Non-official				Official		
	Budget deficit (+)/ surplus(-)	Miscell-aneous financing	Overseas financing	Total	Banks	Authorised dealers in STMM	Other non-bank groups	Total	Reserve Bank	LCIR	Use of cash balances
1986/87	2 631	246	731	1 654	4 400	215	660	5 275	- 2 406	- 14	- 1 201
1987/88	- 2 061	346	- 1 587	- 820	2 753	631	- 1 754	1 630	- 3 601	- 293	1 444
1988/89	- 5 893	- 292	- 3 186	- 2 415	- 74	- 296	- 1 913	- 2 283	- 242	- 195	305
1989/90	- 8 036	- 1 223	- 2 668	- 4 145	- 4 835	986	- 740	- 4 589	-1 436	1 413	467
1990/91	- 1 907	- 287	- 2 056	437	2 126	- 597	234	1 762	531	- 447	- 1 409
1991/92	9 339	- 679	- 603	10 621	866	- 492	4 349	4 723	5 318	- 68	649
1992/93	14 571	- 1 352	- 743	16 665	1 691	1 844	7 735	11 270	5 518	- 356	233
1993/94	13 666	- 976	- 1 064	15 707	2 801	1 044	12 587	16 432	- 901	- 118	294
1994/95	11 627	- 2 163	- 1 246	15 035	442	1 219	11 761	13 421	2 451	- 86	- 751
1995/96	5 045	- 651	- 900	6 596	1 299	- 3 306	8 007	6 000	87	- 338	847
1996/97	- 2 514	43	- 241	- 2 316	- 6 836	- 2 689	3 387	- 6 138	7 091	- 243	- 3 026

Table 5.7B: Commonwealth government securities classified by holder

($ million)

At end of	Loan Consolidation and Investment Reserve		Reserve Bank		Other banks		Authorised money market dealers		Life assurance offices		Other private financial Institutions	
	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes
1984 Jun	764	—	2 962	791	12 382	522	1 451	618	4 934	2	4 299	1
1985 Jun	890	—	6 661	870	13 329	1 219	1 026	639	4 835	—	5 322	13
1986 Jun	757	—	9 690	3 227	14 062	2 053	1 441	964	3 076	—	6 442	32
1987 Jun	743	—	7 284	1 171	18 462	5 517	1 656	99	2 270	—	7 336	341
1988 Jun	450	—	3 683	780	21 215	5 741	2 287	555	1 909	—	6 843	68
1989 Jun	255	—	3 441	526	21 141	6 942	1 991	763	1 795	—	2 402	308
1990 Jun	1 668	—	2 005	387	16 306	4 553	2 977	514	1 749	—	2 197	12
1991 Jun	1 221	—	2 536	104	18 432	8 527	2 380	486	1 348	—	2 268	15
1992 Jun	1 153	—	7 853	593	19 297	9 027	1 888	844	1 370	—	3 529	92
1993 Jun	797	—	13 372	2 655	20 989	9 729	3 094	878	3 209	—	4 767	40
1994 Jun	680	—	12 471	2 777	23 788	10 307	4 777	1 196	5 585	—	5 246	18

Table 5.7C: Commonwealth government securities classified by holder

($ million)

At end of	Government financial institutions		Other public authorities		Other (incl. balancing item)		Total holdings		Memo item: Estimated non-resident holders	
	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes	Total	Treasury notes
1984 Jun	1 741	—	592	—	9 861	139	38 986	2 073	n.a.	n.a.
1985 Jun	2 039	—	671	—	10 651	154	45 424	2 895	n.a.	n.a.
1986 Jun	1 957	—	641	1	11 881	576	49 947	6 853	5 700	n.a.
1987 Jun	1 453	—	432	—	13 166	1 012	52 802	8 140	8 574	n.a.
1988 Jun	1 266	—	468	—	12 417	7096	50 538	7 850	10 208	n.a.
1989 Jun	1 196	20	385	—	15 212	974	47 818	9 533	9 249	982
1990 Jun	949	135	385	—	14 969	2 606	43 205	8 207	12 646	1 185
1991 Jun	878	—	249	—	15 738	2 765	45 050	11 897	12 440	1 646
1992 Jun	1 688	—	950	34	17 294	3 284	55 022	13 874	11 658	1 319
1993 Jun	1 543	—	2 448	500	21 237	1 798	71 456	15 600	14 907	1 007
1994 Jun	2 039	—	3 174	500	29 235	1 387	86 995	16 185	17 928	771

Source: Reserve Bank of Australia (1997), pp. S81–3.

Note the difference between overseas financing and domestic financing and remember that if people hold government securities, they regard them as a profitable, secure investment. Table 5.7B and C shows the stock of accumulated debt at a particular point in time ($86.9 billion at June 1994). It is interesting to note the way in various financial institutions have invested in government securities.

Question 5.12

(a) Distinguish between automatic stabilisers and discretionary fiscal policy.

(b) Can fiscal policy be used to completely eliminate booms and recessions? Why or why not?

(c) Why are governments reluctant to use expansionary fiscal policy to prevent a rise in unemployment?

Question 5.13

(a) What is meant by the 'national debt'?

(b) Should the government be concerned at the size of the national debt in the 1990s?

Net exports

The model of the economy is not complete until we include international transactions involving goods and services which have an effect on aggregate demand. Exports and imports separately account for approximately 20% of real GDP but the level of net exports ($X - M$) tends to be quite small and is sometimes negative.

Table 5.8 shows the components of Australia's exports and imports over 9 years. In looking at the 'Percentage change from previous years', we can see that our rural exports and capital goods imports fluctuate a great deal.

Table 5.9 shows the current account deficit and the current account deficit as a per cent of GDP.

Table 5.8A: International trade in goods and services at average 1989–90 prices

	Credits						Debits					
Period	Balance on goods and services	Total goods and services	Total goods	Rural goods	Non-rural and other goods	Services	Total goods and services	Total goods	Consumption goods	Capital goods	Intermediate and other goods	Services
						ANNUAL ($ MILLION)						
1988-89	- 7,384	57,677	45,933	15,921	30,012	11,744	- 65,061	- 49,148	- 11,822	- 11,805	- 25,521	– 15,913
1989-90	- 7,656	60,839	48,927	15,344	33,583	11,912	- 68,495	- 61,326	- 12,178	- 13,077	- 26,071	– 17,169
1990-91	3,069	67,817	54,833	16,430	38,403	12,984	- 64,748	- 48,857	- 12,045	- 12,279	- 24,533	- 15,891
1991-92	6,795	73,952	60,330	18,155	42,175	13,622	- 67,157	- 51,076	- 12,868	- 11,885	- 26,323	- 16,081
1992-93	6,598	78,503	63,512	18,957	44,555	14,991	- 71,905	- 55,654	- 13,735	- 12,720	- 29,199	- 16,251
1993-94	8,770	86,246	69,274	20,366	48,908	16,972	- 77,476	- 60,298	- 14,371	- 14,098	- 31,829	- 17,178
1994-95	- 1,360	89,930	70,708	19,079	51,629	19,222	- 91,290	- 72,400	- 16,450	- 19,136	- 36,814	- 18,890
1995-96	2,748	99,650	78,670	20,463	58,207	20,980	- 96,902	- 77,469	- 16,868	- 22,403	- 38,198	- 19,433
1996-97	956	109,687	87,727	23,398	64,329	21,960	- 108,731	- 87,983	- 18,795	- 27,139	- 42,049	- 20,748
						PERCENTAGE CHANGE FROM PREVIOUS YEAR						
1988-89	na	1.2	- 0.6	- 5.0	1.8	9.1	23.7	25.2	31.3	40.8	16.8	19.1
1989-90		5.5	6.5	- 3.6	11.9	1.4	5.3	4.4	3.0	10.8	2.2	7.9
1990-91		11.5	12.1	7.1	14.4	9.0	- 5.5	- 4.8	- 1.1	- 6.1	- 5.9	- 7.4
1991-92		9.0	10.0	10.5	9.8	4.9	3.7	4.5	6.8	- 3.2	7.3	1.2
1992-93		6.2	5.3	4.4	5.6	10.0	7.1	9.0	6.7	7.0	10.9	1.1
1993-94		9.9	9.1	7.4	9.8	13.2	7.7	8.3	4.6	10.8	9.0	5.7
1994-95		4.3	2.1	- 6.3	5.6	13.3	17.8	20.1	14.5	35.7	15.7	10.0
1995-96		10.8	11.3	7.3	12.7	9.1	6.1	7.0	2.5	17.1	3.8	2.9
1996-97		10.1	11.5	14.3	10.5	4.7	12.2	13.6	11.4	21.1	10.1	6.8

Table 5.8B: International trade in goods and services at current prices

	Credits						Debits					
Period	Balance on goods and services	Total goods and services	Total goods	Rural goods (a)	Non-rural and other goods (a)	Services	Total goods and services	Total goods	Consumption goods	Capital goods	Intermediate and other goods	Services
						ANNUAL ($ MILLION) (b)						
1988-89	- 6,708	55,318	44,187	15,135	29,052	11,131	- 62,026	- 47,232	- 11,464	- 11,540	- 24,228	- 14,794
1989-90	- 7,656	60,839	48,927	14,240	34,687	11,912	- 68,495	- 51,326	- 12,178	- 13,077	- 26,071	- 17,169
1990-91	- 488	66,190	52,568	13,074	39,494	13,622	- 66,678	- 49,681	- 12,305	- 12,317	- 25,059	- 16,997
1991-92	1,014	69,993	55,427	14,856	40,571	14,566	- 68,979	- 51,469	- 13,669	- 11,897	- 25,903	- 17,510
1992-93	- 2,071	76,804	60,634	16,008	44,626	16,170	- 78,875	- 59,934	- 15,926	- 13,655	- 30,353	- 18,941
1993-94	- 2,249	82,902	64,419	17,130	47,289	18,483	- 85,151	- 64,863	- 17,233	- 14,843	- 32,787	- 20,288
1994-95	- 9,916	87,509	67,000	17,315	49,685	20,509	- 97,425	- 75,218	- 19,418	- 18,541	- 37,259	- 22,207
1995-96	- 1,891	99,004	76,038	19,588	56,450	22,966	- 100,895	- 77,635	- 19,860	- 19,183	- 38,592	- 23,260
1996-97	1,771	105,312	80,816	21,045	59,771	24,496	- 103,541	- 79,346	- 21,293	- 18,884	- 39,169	- 24,195
						PERCENTAGE CHANGE FROM PREVIOUS YEAR						
1988-89	na	7.0	5.5	3.4	6.6	13.5	15.2	16.2	22.2	27.1	9.3	12.2
1989-90		10.0	10.7	- 5.9	19.4	7.0	10.4	8.7	6.2	13.3	7.6	16.1
1990-91		8.8	7.4	- 8.2	13.9	14.4	- 2.7	- 3.2	1.0	- 5.8	- 3.9	- 1.0
1991-92		5.7	5.4	13.6	2.7	6.9	3.5	3.6	11.1	- 3.4	3.4	3.0
1992-93		9.7	9.4	7.8	10.0	11.0	14.3	16.4	16.5	14.8	17.2	8.2
1993-94		7.9	6.2	7.0	6.0	14.3	8.0	8.2	8.2	8.7	8.0	7.1
1994-95		5.6	4.0	1.1	5.1	11.0	14.4	16.0	12.7	24.9	13.6	9.5
1995-96		13.1	13.5	13.1	13.6	12.0	3.6	3.2	2.3	3.5	3.6	4.7
1996-97		6.4	6.3	7.4	5.9	6.7	2.6	2.2	7.2	- 1.6	1.5	4.0

Source: ABS (1998), May, pp. 20–1.

Table 5.9: Current account deficit

	Current account deficit $m	% GDP
1986/87	– 11,672	4.4
1987/88	– 10,217	3.4
1988/89	– 17,185	5.13
1989/90	– 21,460	5.85
1990/91	– 15,332	4.07
1991/92	– 11,573	2.9
1992/93	– 14,882	3.6
1993/94	– 16,655	3.87
1994/95	– 27,569	6.07
1995/96	– 20,299	4.16
1996/97	– 17,875	3.54

Determinants of net exports

Exports are the sale of goods and services produced in Australia to the rest of the world. Export demand is determined by:

- Real GDP in the rest of the world.
- Prices of Australian goods and services relative to rest of world prices for similar goods and services.
- Foreign currency exchange rates.

These factors tend to reflect conditions in foreign economies, so we conclude that exports do not depend directly on the level of Australian GDP. We shall treat exports as an autonomous component of aggregate demand, similar to the way we treated investment and government expenditure earlier in this topic. Exports depend more on world conditions than on domestic factors.

Imports are the purchase of goods produced in the rest of the world by firms and households in Australia. The level of imports or goods coming into a country is determined by:

- Australian real GDP.
- Prices of foreign goods and services relative to domestic prices.
- Foreign currency exchange rate.

Imports depend on Australian GDP. They are a partly autonomous, partly induced, component of expenditure. The import function can be written as:

$$M = Mo + mYD \qquad (5.14)$$

Where *Mo* is autonomous imports and *m* is the marginal propensity to import. The *marginal propensity to import* tells us how much of each additional dollar of income is spent on imports.

☐ *Read Section 22-7 in Begg et al. (2000), pp. 370–3.*

Net export function

For the purpose of our analysis we are primarily interested in *net exports,* where net exports represent expenditure by foreigners on Australian goods and services, minus expenditure by Australians on foreign goods. The *net export function* represents the relationship between *real net exports* and *real GDP*. The net export function can be written as:

$$NX = X - (Mo + mYD) \qquad (5.15)$$

The effect of introducing net exports into the model is to reduce the size of the multiplier. As income rises, both households and firms are likely to demand more imported goods and services. With autonomous exports, this implies that the trade deficit tends to be larger at high income levels, and a larger deficit may act as a constraint on economic growth.

Question 5.14

What is the effect of the following on Australia's net exports?

(a) A decrease in Australia's GDP.

(b) A decrease in Japan's GDP.

(c) A decrease in the world commodity price.

(d) An increase in the price of German-made cars.

(e) Easier credit conditions in Australia.

(f) Tourism booms in Australia, which increased overseas visitors.

(g) The Closer Economic Relations agreement between Australia and New Zealand results in increased trade between the two countries.

The complete macroeconomic model

We have now completed our model of national income determination. It consists of a series of variables, some exogenous (or autonomous) and others endogenous (induced). These variables can be shown as series of behavioural equations which indicate the responses of the sectors in the economy to changes in the level of output/income, or to demand 'shocks'. In the following section, the income determination model is explained using algebraic analysis. You are not expected to learn all the algebra if you have no mathematical background. It is presented here to show the logic behind the multiplier concept, and the theory of national income determination.

The following equations describe our 'demand-determined' model:

$$AD = C + I + G + NXC = Co + cYD$$

$$YD = Y - T$$

$$T = To + tY$$

$$I = I^*$$

$$G = G^*$$

$$X = X^*$$

$$M = Mo + mYD$$

$$NX = X^* - M$$

* refers to autonomous expenditure

Collect terms and rearrange to get:

$$\begin{aligned}
AD &= Co + c[Y - (To + tY) + I + G + X - [Mo + m(Y - [To + tY])] \\
&= Co + I + G + X + c(Y - To - tY) - Mo - mY + mTo + mtY \\
&= Co + I + G + X - Mo + cY - cTo - ctY - mY + mTo + mtY \\
&= Co + I + G + X - Mo + cY - mY - cTo + mTo - ctY + mtY \\
&= Co + I + G + X - Mo + Y(c - m) - To(c - m) - Y(ct - mt) \\
&= Co + I + G + X - Mo - To(c - m) + Y(c - m) - Y(ct - mt)
\end{aligned}$$

At equilibrium $AD = Y$

Therefore,

$$Y = Co + I + G + X - Mo - To(c + m) + Y(c - m) - Y(ct - mt)$$

(and shifting the last two terms to the left hand side)

$$Y - Y(c - m) + Y(ct - mt) = Co + I + G + X - Mo - To(c + m)$$

$$Y(1 - c + m + ct - mt) = Co + I + G + X - Mo - To(c + m)$$

$$Y = \frac{Co + I + G + X - Mo - To(c + m)}{1 - c + m + t[c - m]} \tag{5.16}$$

This is the general formula for equilibrium real GDP. Note that the autonomous expenditure is given by the numerator:

$$Co + I + G + X - Mo - To(c + m)$$

Referring to equation 5.16, one over the denominator

(i.e. $\frac{1}{1 - c + m + t(c - m)}$)

equals the spending multiplier for a model with proportional income taxes, and a foreign sector. Thus, the multiplier is reduced by a lower marginal propensity to consume (c), a higher marginal propensity to import (m) or a higher proportional tax rate (t). This means that equilibrium GDP can be determined by identifying the change in autonomous expenditure and multiplying it by the multiplier.

This model of the economy shows that the equilibrium level of expenditure occurs when aggregate planned expenditure equals real GDP. At equilibrium there are no unplanned changes in inventories and no changes in production. Aggregate expenditure is equal to the total output of the economy, which is also equal to the aggregate income generated by production. It is important to realise that this equilibrium is not necessarily the level of full employment or potential output. The economy can end up with a level of output below full employment and there will be no incentive for firms to increase output, given the existing level of prices and wages.

The model is useful in helping to explain the fluctuations in economic activity from one period to another. Economic forecasters seeking to predict the behaviour of the economy in the future can use this framework and try to anticipate changes in *C*, *I*, *G*, or $(X - M)$, and estimate the likely impact of such changes. However, it does not imply that the problems of unemployment can be solved by merely manipulating aggregate demand through fiscal policy. It is difficult to accurately determine many of the economic variables, particularly the level of business investment and exports. Also, some of the factors that influence aggregate demand are very uncertain, for example, consumer confidence and business expectations.

Summary

In this topic we have broken down aggregate demand into its various component parts and analysed the behaviour of each sector. The determinants of the household's consumption function were discussed and a model built up which explained the behaviour of consumption with reference to income. The concepts of the *APC*, *APS*, *MPC* and *MPS* were outlined and analysed. The marginal propensity to consume was an important feature of this discussion because it indicated the change in consumption as income changed (and also the slope of the consumption function).

The discussion of investment indicated that decisions to invest are strongly influenced by expectations. The more optimistic businesses are about the future, the more likely they are to invest. Government expenditure was shown to be largely independent of the current level of real GDP and therefore part of the autonomous component of aggregate demand. Exports are also an autonomous component of aggregate demand whereas imports are partly an induced expenditure, that is, dependent to some extent on the level of income in Australia.

Equilibrium expenditure occurs when aggregate planned expenditure equals real GDP and this equilibrium can be shown in table form, graphically, or as a series of equations.

Review questions

Background

The following table shows some date on consumption and income (output) for the economy of Hypothetica.

Income and Consumption in Hypothetica (in $ billions)

Income (output)	Planned Consumption
50	35
100	70
150	105
200	140
250	175
300	210
350	245
400	280

Planned investment is autonomous, and is $60 billion per period.

Review question 5.1

(a) What is the marginal propensity to consume?

(b) Calculate savings and aggregate demand at each level of income.

(c) For each level of output, work out the unplanned change in inventory holdings and the rate of actual investment.

(d) If, in a particular period, income turned out to be $100 billion, how would you expect producers to react?

(e) If, in a particular period, income turned out to be $350 billion, how would you expect producers to react?

(f) What is the equilibrium level of income?

(g) If investment increased by $15 billion, what would be the change in equilibrium income?

(h) Calculate the simple multiplier.

Review question 5.2

Suppose our Hypothetical consumers become more spendthrift, and the marginal propensity to consume increases to 0.8 (that is, 80 cents in each extra dollar is spent). Also, assume investment has increased to $90 billion per period.

(a) Calculate the new equilibrium level of income.

(b) Calculate the value of the multiplier.

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Suggested answers

Topic 5

In-text questions

Question 5.1

	% Contribution to GDP 1990–91	 1995–96
Consumption	59.8	60.3
Investment	19.8	19.4
Government	19.5	18.5
Net Exports	1.14	0.85

Note the relative stability of consumption and investment expenditure. Government expenditure and net exports have declined as a per cent of GDP which indicates the greater strength of the domestic economy in the later period.

Question 5.2

(a) Aggregate demand is *OB*: there is excess demand at this point.

(b) Inventories will be run down to the extent of the excess demand, measured by *AB*

(c) We would expect firms to increase output in the next period.

(d) Income *OH* = planned expenditure *OD*.

(e) Aggregate planned expenditure is *OE*: there is excess supply at this point.

(f) Inventories will increase to the extent of the excess supply—*EF*. Firms are likely to respond by reducing output.

Question 5.3

Students should make their own comments about the importance of each of these factors in relation to their consumption decisions. Other factors which might cause people to consume more or less at each possible level of income include:

Price level.

Expectations.

Consumer confidence.

Consumer indebtedness.

Structure of the taxation system, and rates of taxation.

Stage in life

Question 5.4

(a) 400
(b) 0.75
(c) $C = 1{,}900$
(d) $S = -400 + 0.25YD$
(e) 0.25
(f) $S = 100$

Question 5.5

(a) The multiplier will have a value of ∝, 10, 3, or 2.

(b) GDP will increase by $40 billion.

Question 5.6

(a) If this simply means households have become less wealthy, then consumption will decline and saving will increase. However, if it means that households are cashing in their bonds to spend more, then the consumption schedule will shift up and the saving schedule will shift down.

(b) A sharp decline in stock prices can normally be expected to decrease consumer spending because of the decrease in wealth: the consumption schedule shifts down, the saving schedule shifts up.

(c) The expected decrease in benefits will cause households to save more: the saving schedule will shift up, the consumption schedule will shift down.

(d) The consumption schedule will shift upwards and the saving schedule will shift downwards because expectations of rising prices tend to trigger more spending and less saving. People 'buy now' to escape higher future prices.

Question 5.7

If, by definition, all that you can do with your income is use it for consumption or saving, then if you consume more, you will save less, and vice versa. The exception if a change in personal taxation. When this changes, your disposable income changes and therefore your consumption and saving both change in the same direction and opposite to the change in taxation.

Question 5.8

Saving is nonspending. If this saving is borrowed and used by businesses, all will be well: desired saving will equal planned investment and there will be no shortfall in demand for goods and services. All that is produced will be sold. But if desired saving is greater than planned investment, then undesired build-up of inventories will occur; that is, unplanned investment will take place. To get rid of the undesired inventory, businesses will decrease production until incomes have decreased to the point that, out o the lower incomes, saving will have decreased to equality with planned investment.

The significance of the paradox of thrift is that although saving is essential for investment, it must not increase ahead of investment. When this does happen, saving is forced back down until saving equals planned investment.

Question 5.9

(a) Interest rates may influence investment decisions because they represent the cost of finance, that is, they represent the opportunity cost of the investment capital. The funds could have been invested in an interest-earning asset. It is important to note that it is the real interest rate, rather than the nominal rate, that is crucial in making investment decisions. The real interest rate is estimated as the nominal rate less the rate of inflation.

Expectations are a very important determinant of business investment because the decision is generally based upon expected profits. The profitability of any capital investment will depend upon business planners' expectations of the future sales and future profitability of the product that the capital helps produce. Business expectations may be based upon elaborate forecasts of future business conditions that incorporate a number of 'business indicators'.

(b) Other factors which may influence a firm's decision to invest include:

acquisition, maintenance, and operating costs of capital equipment;

business taxes;

technological change;

stock of capital goods on hand.

These all affect the profit level expected by a firm and therefore the willingness to invest.

Question 5.10

(a) The investment decision depends on expected profits, expected inflation, available business opportunities and the market rate of interest, not specifically the current level of income.

(b) Firms demand investment funds whenever the expected rate of return for an investment exceeds the market rate of interest. The lower the interest rate, the greater the number of investment projects that are profitable to undertake. Hence the greater the demand for investment funds. If the interest rate is high, firms may prefer to put their funds to alternative uses.

(c) The investment function relates investment spending and disposable income. The investment function is autonomous, which means that disposable income has no effect on investment, and investment spending can be pictured as a horizontal line when disposable income is measured along the horizontal axis. Hence the increased investment spending caused by a reduction in the interest rate is shown by an upwards shift of the investment function.

Question 5.11

(a) The increase in government spending of $100 billion will increase *AD* and therefore GDP, by $400 billion, if the *MPS* is 1/4 and the *MPC* is 3/4. (Remember the formula for the multiplier). But the effect of an increase in taxes on *AD* is not as direct, because taxes affect *C*. With an *MPC* of 3/4, increased taxes of $100 billion will decrease *C* by $75 billion, and S by $25 billion. (*C* and *S* are both determined by *YD*). With a multiplier of 4, the $75 billion decrease in *C* causes a $300 billion decrease in equilibrium GDP. But the $100 billion increase in *G* had resulted in an increase of $400 billion. The net effect is an increase in GDP of $100 billion.

(b) This will be true regardless of the size of the *MPS*.

Question 5.12

(a) Automatic stabilisers are mechanisms in the budget that respond to the overall level of economic activity. Proportional tax rates and unemployment benefits are examples of automatic stabilisers and they have the effect of making the deficit grow during a recession and diminish in a boom.

(b) Fiscal policy cannot always eliminate booms and recessions due to the following factors:

1. There may be time lags—it takes time to monitor the progress of the economy and to decide what policy action is required.
2. There is much uncertainty—it is difficult to predict the timing of policy effects.
3. There may be feedback or induced effects on other components of aggregate demand.

(c) Fiscal expansion cannot necessarily be used to reduce unemployment due to the problem of persistent, large budget deficits. Also the problems may be on the supply side and fiscal expansion may only worsen the situation.

Question 5.13

(a) The national, or government debt is the accumulation of all the past government deficits, minus all the past surpluses.

(b) It is sometimes argued that the annual *public sector borrowing requirement (PSBR)* must be kept low in order to keep the national debt under control. However, the debt:GDP ratio has been relatively low in recent years even though the debt has been rising.

Question 5.14

N.B. The answers given here do not take exchange rate impacts into account. The international sector and exchange rates will be dealt with in Topic 12.

(a) A decrease in the Australian GDP could decrease imports and therefore increase net exports.

(b) A decrease in Japan's GDP could decrease exports and decrease net exports.

(c) A decrease in the world commodity price will decrease the value of our exports since commodities comprise a major part of our exports. Net exports decrease.

(d) An increase in the price of German made cars could decrease the quantity demanded and therefore decrease our imports (assuming the demand for the cars is relatively elastic). Net exports increase.

(e) Easier credit conditions will increase demand generally and therefore increase imports, resulting in decreased net exports.

(f) Increased number of overseas visitors has an effect similar to increasing our exports of goods (i.e. foreign funds come into the country). Net exports increase.

(g) Indeterminate effect on net exports. It depends on the extent to which the level of exports and imports changed as a result of the new trade agreement.

Review questions

Review question 5.1

(a) As income increases by 50, consumption increases by 35, so the marginal propensity to consume is 0.7.

The answers to (b) and (c) are shown in the following table.

Income, etc. (Hypothetica)

Income	Pl. Cons.	Pl. Invest.	Savings	Agg. Dem.	Unpl. Inv.	Actual Inv.
50	35	60	15	95	−45	15
100	70	60	30	130	−30	30
150	105	60	45	165	−15	45
200	140	60	60	200	0	60
250	175	60	75	235	15	75
300	210	60	90	270	30	90
350	245	60	105	305	45	105
400	280	60	120	340	60	120

(d) With income at 100, aggregate demand is 130, so that stocks will be rapidly run down. Producers are likely to react by producing more output in the next period.

(e) With income at 350, aggregate demand is only 305 and producers will find that they cannot sell their output, so stocks begin to build up. They are thus likely to reduce the output in the next period.

(f) Only at income of 200 do we find that aggregate demand equals aggregate supply—or, equivalently, that planned investment equals planned savings. This then is the equilibrium level of income.

(g) An increase in investment to $75 billion would increase equilibrium income to 245.

(h) The $15 billion change in investment is multiplied by 1/1 – *MPC*.

— an increase of 15/0.3 = 45 (approx.). Multiplier is 3.33

Review question 5.2

Refer to the following table:

Pl. cons	Pl. invest	Agg. Dem
mpc 0.8		
40	90	130
80	90	170
120	90	210
160	90	250
200	90	290
240	90	330
280	90	370
320	90	410
360	90	450

(a) With the higher propensity to consume, we get an equilibrium of 450.

(b) The value of the multiplier is 5. (50/10) or $\frac{1}{(1-0.8)}$.

Aggregate supply, business cycles and policy perspectives

Topic 6

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Readings 6.1–6.3

Introduction

In the previous two topics of our study of macroeconomics, we have addressed the following issues:

1. Measurement of economic activity by national income accounting.

2. Use of statistical data to assess the performance of the economy.

3. Analysis of aggregate demand and equilibrium expenditure.

In this topic we shall introduce the concept of *aggregate supply,* or firms' willingness and ability to produce, and show how supply decisions made by firms and resource suppliers are based on the expected price level. Using the concepts developed in Topic 5, we can show how shifts in aggregate demand in the income/expenditure diagram enable us to illustrate the relationship between aggregate demand and the price level. Then, by combining both aggregate demand and aggregate supply we can show how equilibrium price and output levels are determined.

In discussing how the economy allocates resources we cannot assume macroeconomic stability. The level of economic activity, as measured by real GDP, tends to fluctuate in a regular way. The *business cycle* reflects the rise and fall of economic activity relative to the long-term growth trend of the economy, but the turning points of these cycles are difficult to identify. In this topic we will analyse the main features of the business cycle and consider alternative explanations for its existence. We will also discuss certain economic variables that may be used to identify periods of expansion or contraction. *Economic indicators* assist economists and business managers as they endeavour to predict the peak of a boom or the beginning of a recovery from recession.

We conclude our study of specifically macroeconomic issues by looking at the *economic policy debate.* Is the economy essentially stable and self-correcting, or is it essentially unstable and in need of interventionist policies? What are the implications and likely impacts of different types of policies? Demand management policies imply the use of monetary and fiscal policy to stabilise national income at an acceptable level. Supply-side policies refer to the use of microeconomic incentives to increase equilibrium employment and potential output.

Objectives

At the end of this topic you should be able to:

- explain the concept of the aggregate supply curve, its shape and what causes it to shift;

- explain the way in which equilibrium is achieved using aggregate demand and aggregate supply;

- describe the way the level of economic activity fluctuates over time and identify the major determinants of the business cycle;

- outline the stabilisation problem and compare the alternative approaches to stabilising the economy.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 26, 31, 32.

Readings

Reading 6.1
McTaggart, et al.
'Influences on aggregate demand and aggregate supply'

Reading 6.2
'Composite Leading Indicator September quarter 1996'

Reading 6.3
Economic Roundup
'Economic overview'

Aggregate supply

Aggregate supply refers to the output that firms are willing and able to produce at a particular price level. It is the outcome of all the supply decisions made independently by the firms in the economy. These supply decisions depend on the quantity and quality of the resources available and the cost of those inputs. The amount that a profit-seeking firm will produce is dependent upon the prices received for the output, the prices paid for wages and other production costs, the state of technology, the level of productivity, and the availability of labour and capital.

For the economy as a whole, we use the concept of an *aggregate supply schedule,* and/or curve, to indicate the sum of the quantities supplied by firms at a particular price level. The amount a firm is prepared to supply depends on the price it receives. At higher prices, the profit-maximising level of output for each firm is higher because it pays to produce more, *ceteris paribus*. Each price therefore, generates a particular aggregate supply.

It is important to remember that in macroeconomics we are focussing on the aggregates that describe the economy. 'Output' is the sum total of the real value of all goods produced in the economy—in other words, real GDP. 'Price' refers to the average level of prices in the economy, for example, the GDP deflator. Consequently, in deriving an aggregate supply curve, we assume no change in relative prices, and we ignore issues about the composition of output.

When looking at aggregate supply, it is necessary to distinguish between two time frames: the short run and the long run.

- The *short run* is a period during which the prices of goods and services change in response to changes in demand and supply but the prices of factors of production—wage rates and the prices of raw materials—do not change.

- The *long run* is a period that is sufficiently long for the quantities and prices of all the factors of production to have adjusted to any disturbances in such a way that quantities demanded and supplied are equal in all markets (McTaggart 1996, p. 566).

Meaning and significance of aggregate supply

☐ *Read Section 26-2 in Begg et al. (2000), pp. 429–32.*

A firm's supply decision is influenced by the labour market and the capital market—these two markets are generally referred to as the *factor markets*. Firms will employ labour as long as it is profitable for them to do so. The same applies to the use of capital equipment. That is, the increase in total output that results from the addition of an extra unit of input (whether it be labour or capital) must be equal to, or more than, the factor price (the cost of that unit of input).

The other important influence on aggregate supply is the state of technology—the state of scientific and managerial knowledge. Finding new and better ways to produce, results in more output for a given quantity of inputs. Technology also refers to the management skills of the organisation and the methods used to combine inputs more efficiently.

For the economy as a whole, the total quantity of inputs available is a significant determinant of aggregate supply. The larger the labour force, the more we can produce; the larger the stock of plant and equipment, the more productive the labour force will be. Increased human capital, the skills that people obtain through education and training, will also result in increased productive capacity.

In general, when prices are high businesses would like to sell all they can produce. Firms may, for a time, even produce above their sustainable potential output by inducing employees to work overtime and deferring necessary servicing of machines. At other times, prices and spending levels may be depressed and businesses then cannot sell their full capacity output. Workers may be laid off and machines left idle as production is cut back. Nevertheless, there is a physical limit to the amount the economy can produce in the short run, given the factors of production available.

Changes to aggregate supply may result in a shift of the entire curve (to the right or left) if there is a change in technology, input prices or the quantity and quality of the productive resources available. A change in the slope of the short run aggregate supply curve (from horizontal to upward sloping or vertical) will occur if there is a change in the general price level. In the horizontal range of aggregate supply, output may increase and there will be no change in the price level. There is idle capacity available. In the upward sloping range, the only way output can increase is if suppliers receive higher prices for their production. The increased prices encourage more producers to come into the market and existing producers may increase their production. In the vertical range of aggregate supply, the economy is at its productive capacity and output cannot increase further even if prices rise.

If firms are operating at their physical limit for any length of time, they will be induced to permanently expand their capacity, e.g. build a new factory or buy new equipment. Thus, in the long run, aggregate supply may increase. This can result in an outward shift of the aggregate supply curve.

Question 6.1

(a) Why do firms tend to expand output when the actual price level exceeds the expected price level on which current long-term labour contracts are based?

(b) Why do production costs rise when actual output exceeds potential output?

Short run vs long run aggregate supply

The short run aggregate supply curves

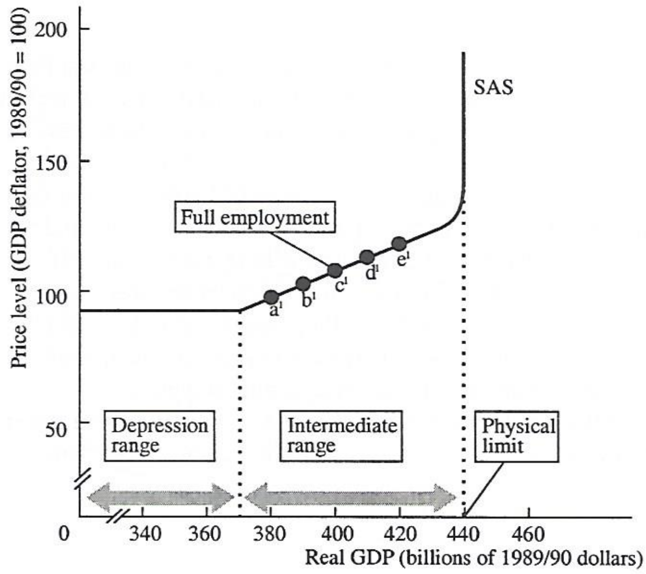
A typical short-run aggregate supply (SAS) curve is shown below in Figure 6.1(a). It is upward sloping indicating that increases in the price level lead to greater output. At low levels of output, the SAS curve is relatively flat (or elastic), while at high levels of output, it is relatively steep (or inelastic). The SAS curve is often depicted with three ranges: a horizontal (or depression) range, an upward sloping (or intermediate) range, and a vertical (or physical limit) range (McTaggart 1996, p. 567).

- In the *horizontal* range, firms have a great deal of unused capacity. They would produce and sell more at the prevailing prices if there was sufficient demand.

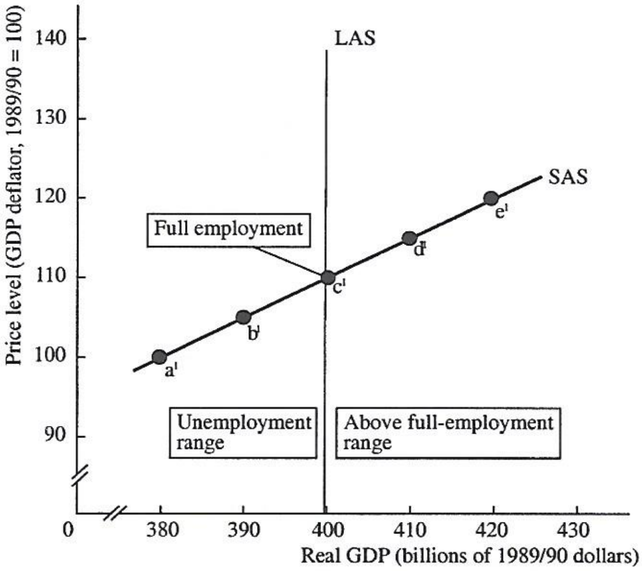
- In the *intermediate* range, both prices and output may change. In the short run, when the price level changes, the prices firms receive for their products rise, while the prices of their inputs (such as wages) often remain constant. Hence, profits rise, and firms respond by increasing output. With expanding output, production becomes less efficient as firms approach full capacity. To keep profits rising, and to induce firms to supply more output, higher product prices must be received to cover higher per unit costs of production (Waud et al. 1996, p. 587).

- In the *vertical* range, firms are working at full capacity and expansion of output is not possible, even if the price level increases.

Figure 6.1: The aggregate supply curves and aggregate supply schedule



(a) The short-run aggregate supply curve



(b) The short-run and long-run aggregate supply curves

Source: McTaggart et al. (1996), p. 567.

The long-run aggregate supply curve

The long-run aggregate supply curve (LAS) is typically shown as a vertical line (see Figure 6.1(b)). There is only one level of output that can be produced when the economy is at full employment, no matter how high the price level is. In the long run, all prices are flexible, including wages and other input prices. If the prices firms receive for their products are increasing, then over time, the prices they have to pay for their inputs will also increase (because, for example, workers will insist upon compensating increases in money wages). Profits will remain the same, so there is no incentive for firms to increase output.

Question 6.2

(a) Explain the derivation of a short-run aggregate supply curve.

(b) Why is long-run aggregate supply vertical?

One of the reasons why we make a distinction between short run and long run aggregate supply is because, after a particular demand shock, a period of time is required for the economy to make all necessary adjustments. In the short run, there is wage inflexibility, because it is difficult to change wages quickly. Sluggish wage adjustment is the most likely cause of the slow adjustment of prices to changes in aggregate demand. If demand falls, firms may reduce overtime, shorten the working week or lay-off workers. It is only if, and when, the firm's management decides that future demand prospects are not good, that they may eventually decide to fire workers. Also, firms and workers may come to an agreement that wages will not be cut dramatically in recessions, nor increased significantly in booms. In the short run, variations in labour input are met mainly by changing hours. But in the long run, the number of workers will be adjusted.

☐ *Read Section 12-7 in Begg et al. (2000), pp. 190–3, for further discussion of labour market inflexibility.*

Also read Section 26-5 in Begg et al. (2000), pp. 437–9, and particularly note Table 26-1.

Question 6.3

Consider each of the following factors. Explain which of them encourage, and which discourage, rapid adjustment in the labour market. For each of the factors, state whether you expect firms or workers to be mainly affected.

(a) The costs of job search.

(b) Lack of redundancy agreement.

(c) Predominantly unskilled workforce.

(d) Production process well suited to short-time or overtime working.

(e) Concern of firm for its reputation as an employer.

(f) Unemployment at low level.

(g) Acquisition of firm-specific skills.

Shifts in the aggregate supply curve

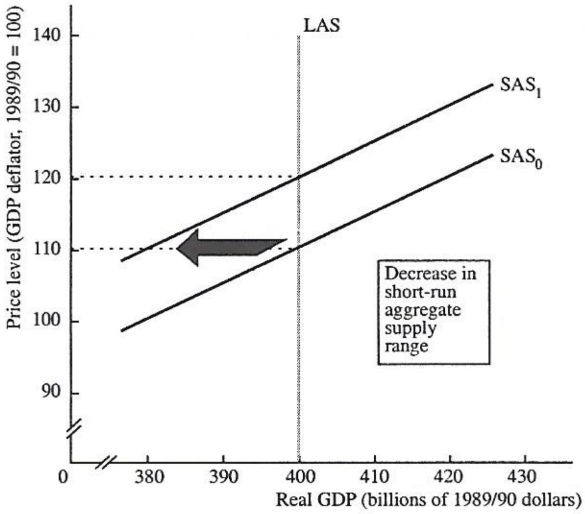
☐ *Read Section 26-8 in Begg et al. (2000), pp. 443–4.*

Shifts in the aggregate supply curve (both SAS and LAS) arise due to changes in factors other than the price level. Such factors include:

- input prices;
- certain kinds of taxes;
- technology;
- size of the labour force and capital stock.

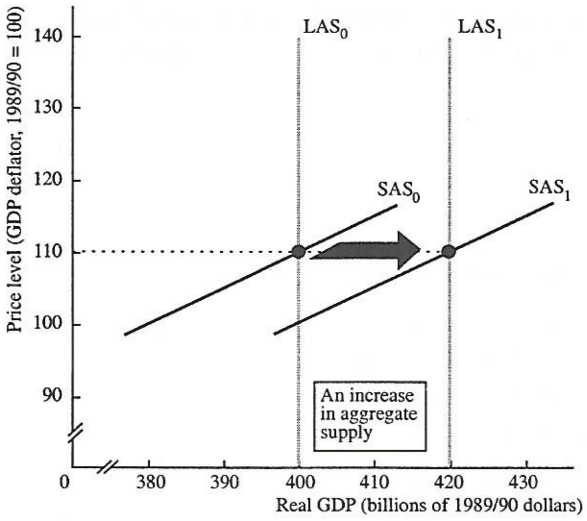
Factors that change aggregate supply will cause either the short-run aggregate supply curve to shift, leaving the long run aggregate supply unchanged, or cause both of the curves to shift. Changes in wage rates and other input prices will shift short-run aggregate supply only, whereas changes in taxes, technology and the quantity of factors available will also shift long-run aggregate supply. If there is a change in any of these factors, such that aggregate supply is able to increase, there may be little effect on prices and output in the short run. But in the long run, output is permanently higher at the new level of potential output and prices are permanently lower (see Figure 6.2).

Figure 6.2: Changes in aggregate supply



(a) A decrease in short-run aggregate supply

An increase in wage rates or in the prices of other factors of production decreases short-run aggregate supply but does not change long-run aggregate supply. It shifts the short-run aggregate supply curve leftward and leaves the long-run aggregate supply curve unaffected. Such a change is shown here. The original short-run aggregate supply curve is SAS_0 and after the wage rate has increased, the new short-run aggregate supply curve is SAS_1.



(b) Long-run growth in aggregate supply

Aggregate supply increases in the long run if:

- The labour force increases.
- The capital stock increases.
- Technological change increases the productivity of labour and capital.

Both the long-run and short-run aggregate supply curves shift rightward and by the same amount.

Source: McTaggart et al. (1996), pp. 570–1.

☐ *This issue is well explained in Reading 6.1 'Influences on aggregate demand and aggregate supply'. Go through this reading now and make sure you understand how the diagrams have been interpreted and how the story concluded.*

Question 6.4

(a) What are supply shocks?

(b) How do supply shocks affect the short-run aggregate supply curve?

(c) How do supply shocks affect the long-run aggregate supply curve?

We have now looked at both aggregate demand and aggregate supply, and it is time to see how both these schedules or curves interact to determine and equilibrium price and level of output.

Equilibrium price and output

The central concepts for understanding macroeconomic forces in the economy are aggregate demand (AD) and aggregate supply (SAS or LAS). Where these two curves (lines) intersect on a graph is the equilibrium price/output level. As shown in Topic 5, aggregate demand is the planned expenditure of households, firms, governments and foreigners at a given price level. In Topic 5, we described aggregate demand within the income/expenditure framework, holding the price level constant. We now show aggregate demand as the quantity of real GDP demanded at each price level, holding all other influences constant.

☐ *Read sections 26-1 to 26-4 in Begg et al. (2000), pp. 427–37.*

N.B. Begg et al. (2000) refer to aggregate demand as 'macroeconomic demand' and give it the notation 'MDS'.

Figures 26-4 and 26-5 in Begg et al. (2000) show this relationship between real GDP and the price level. The effect of a change in the price level will be a movement along the existing aggregate demand curve. A change in any of the other influences on the quantity of real GDP demanded results in a shift of the aggregate demand curve to a new position.

Price level and other factors affecting aggregate demand

Aggregate demand slopes downward because consumers are able to get more from their income and wealth at a lower price level. The lower price level increases the purchasing power of consumer wealth and causes them to increase the quantity of goods and services they demand. In addition, the lower price level decreases the transactions demand for money and this may drive interest rates down. Lower interest rates tends to encourage consumption and investment expenditure. Lower domestic prices may also make imports less attractive and lead to an increase in demand for home produced goods.

The price level is not the only factor that affects aggregate demand. Shifts in the aggregate demand curve arise due to changes in the following factors:

- expectations;
- fiscal policy;
- monetary policy;
- conditions in foreign economies.

Aggregate demand will increase if there are optimistic expectations about the economy's future, if government spending increases or taxes are lowered, if interest rates are lower, or if foreigners earn higher incomes. Aggregate demand will decrease if there are pessimistic expectations about the economy's future, if government spending is reduced or taxes are increased, if interest rates rise, of if there are unfavourable conditions in foreign economies.

Question 6.5

Which of the following factors would you expect to affect the demand side of the economy and which the supply side? State whether each leads to an increase or a decrease in demand or supply:

(a) An increase in the number of married women going out to work.

(b) An increase in the price of a vital imported raw material.

(c) An increase in business confidence.

(d) An autonomous increase in money wages.

(e) A fall in the nominal money supply.

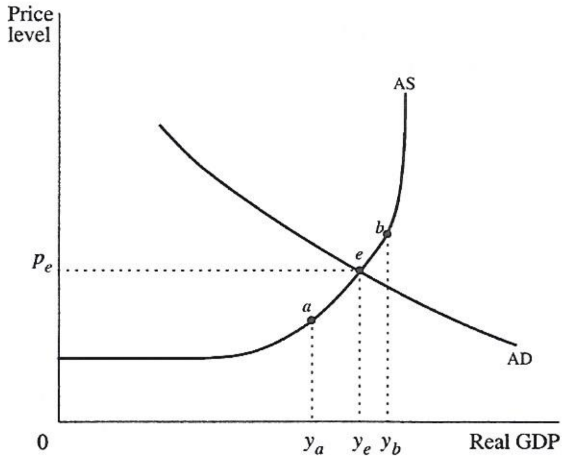
(f) A shift in the distribution of income from rich to poor.

(g) An increase in the demand for leisure.

Macroeconomic equilibrium

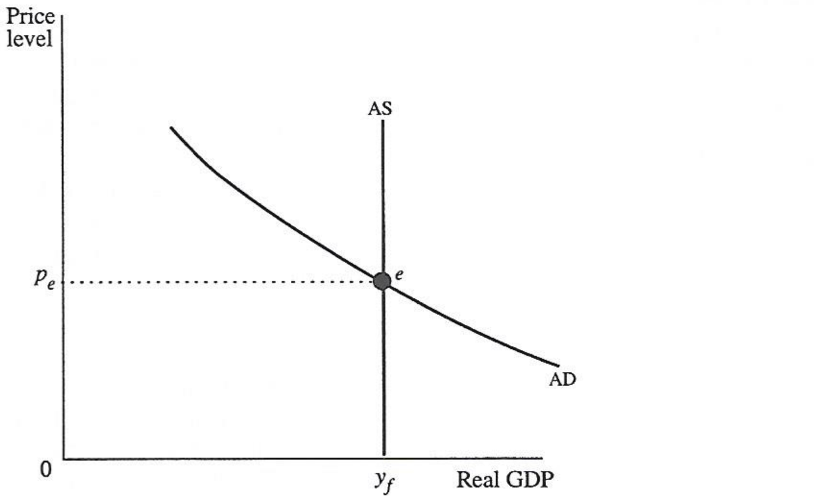
The interaction of aggregate demand and aggregate supply, in both the short run and the long run, is shown in Figures 6.3 and 6.4. The intersection of AD and SAS or LAS is *macroeconomic equilibrium.* There is only one price level where the quantity demanded equals the quantity supplied and this is the equilibrium position. If the price level is higher than equilibrium there would be an excess of quantity supplied over quantity demanded. If firms are unable to sell such a surplus, they would cut prices and production. With lower prices, there is an increase in demand and with lower production, the surplus would be eliminated. The opposite would occur if the price level was lower than equilibrium. Although employment is not shown directly in these diagrams, firms often hire additional workers to produce more goods and services. Higher levels of aggregate output usually reflect higher levels of employment.

Figure 6.3: Aggregate demand and supply determine the economy's equilibrium price level and real GDP



The intersection of the *AD* and short-run *AS* curves at point *e* determines the economy's equilibrium price level p_e and real GDP (total output) y_e in the long run. Overproduction to point *b* leads to unwanted inventory buildup, causing the economy's producers to cut back production to the equilibrium level *e* along *AS.* Underproduction to point *a* leads to an unwanted reduction of inventories, prompting the economy's producers to increase production to *e.*

Figure 6.4: Long-run equilibrium in an economy

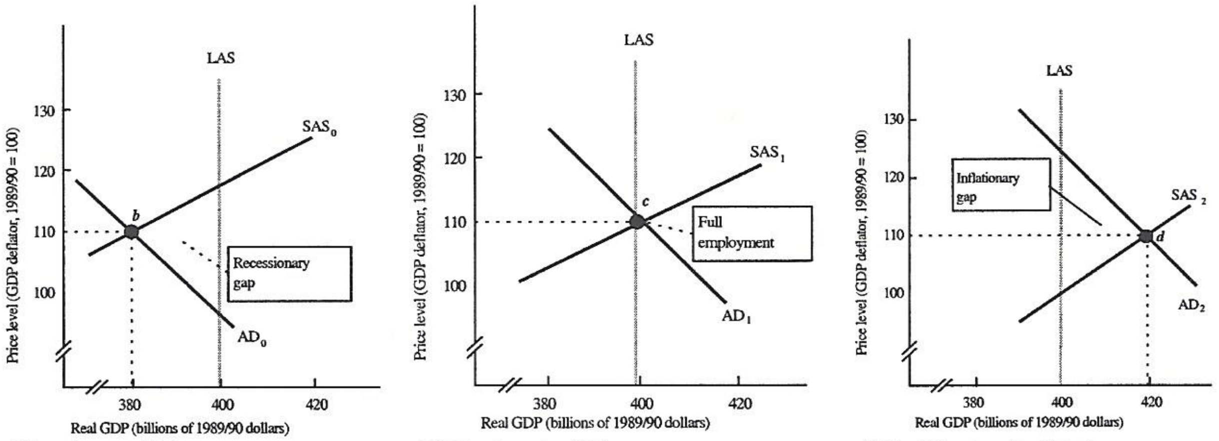


Long-run equilibrium occurs at the potential output level y_f where the long-run *AS* curve cuts the *AD* curve.

Source: Waud et al., (1996), p. 592.

As we noted in Topic 5, macroeconomic equilibrium does not necessarily occur at full employment. For full employment to occur in the aggregate demand/aggregate supply analysis, the economy needs to be on its long run aggregate supply curve. Yet macroeconomic equilibrium occurs at the intersection of the short run aggregate supply curve and aggregate demand. This can be at, below or above the full employment level as shown in Figure 6.5. The economy moves from one type of equilibrium to another as a result of disturbances to aggregate demand or short run aggregate supply. These disturbances produce fluctuations in real GDP and the price level (McTaggart 1996, p. 573).

Figure 6.5: Three types of macroeconomic equilibrium



(a) Unemployment equilibrium

(b) Full-employment equilibrium

(c) Above full-employment equilibrium

Source: McTaggart et al. (1996), p. 573.

We have developed this aggregate demand/aggregate supply analysis to enable us to predict likely changes in real GDP and the price level. We can use this approach as we try to understand economic fluctuations because it gives us a broad view of trends and cycles. We can assess the major sources of fluctuations in both aggregate demand and aggregate supply, identify the equilibrium price/output level, and determine whether this is at full employment or not. This macroeconomic equilibrium price level is very significant. It indicates that the labour market is in equilibrium at the ruling real wage rate (money wages have adjusted), the ruling interest rate is a result of equilibrium in the money market, and actual demand for goods and services equals actual output at that price level.

Whenever the economy is in long-run equilibrium, real GDP is equal to the potential output (LAS is vertical). This potential output GDP is consistent with any price level because all resource prices have had time to adjust to the actual price level. Economists question whether an economy will consistently approach this long-run situation, traditionally known as the 'full employment' output level. (N.B. 'Full employment' means unemployment is at its natural rate which encompasses structural and frictional unemployment.) Some economists believe that if markets are competitive, they will clear rapidly. Full employment of all resources will result because prices will adjust. Other economists believe the adjustments, if any, will be slow, and changes in long-run equilibrium are demand-determined.

Question 6.6

Consider each of the following and try to assess whether its impact would be on the AD curve or the AS curve. For each case use the AS-AD diagram to determine its likely impact on real GDP and the price level.

(a) OPEC is wound up and the world oil producers engage in a fierce competitive struggle for markets.

(b) Australia suffers its worst ever drought.

(c) The country is committed to a massive defence expenditure.

(d) The government ends the migration program and announces that as a consequence spending on school, hospitals and public housing will also be pruned.

The basics of aggregate demand and aggregate supply presented in this topic have given us a framework for thinking about macroeconomic issues and problems. Together with the income/expenditure framework developed in Topic 5, we are now in a position to focus on the causes of economic fluctuations, unemployment and inflation. We will also be able to consider various policies which address these problems.

Business cycles

Economic growth, as measured by the rate of growth of real GDP, is not a smooth process. The rate of growth fluctuates around a long term trend. These fluctuations in economic activity vary a great deal in length and intensity, but have some common features. Firstly, business cycles tend to involve the entire nation and often much of the world economy. Also, they impact on many aspects of our economy, not just employment and production levels, and a cycle can last for several years. The timing of a business cycle is random and quite unpredictable.

☐ *Read pp. 526–8 in Begg et al. (2000), and particularly refer to figures 31.1 and 31.2, p. 527.*

Question 6.7

Using Table 6.1, draw a graph in which you plot the percentage annual change of GDP(E) and GDP(I) against time. (Your graph will be similar to Figure 31.2 in the text although covering a shorter period of time). When, over recent years, did the Australian economy experience a peak and a trough in the level of economic activity? How does this compare to the UK experience?

Table 6.1: Selected gross product aggregates at average 1989–90 prices

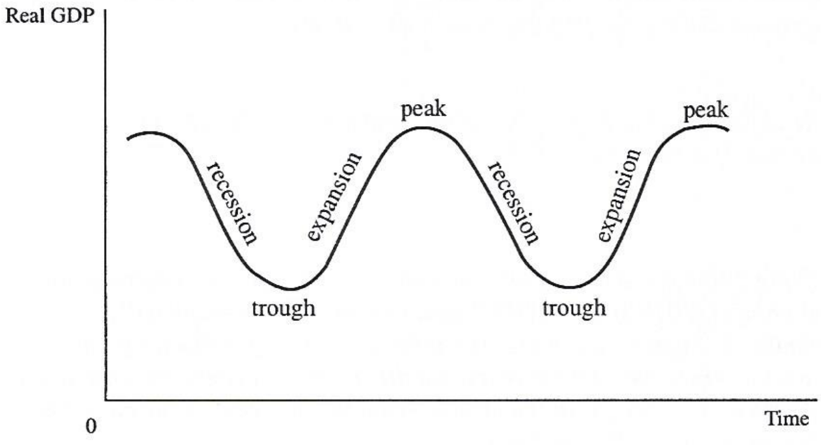
						GDP (I)			
Period	*GDP(A) average*	*GDP(I) income based*	*GDP(E) expenditure based*	*GDP(P) production based*	*Real gross domestic income*	*Gross non-farm product*	*Gross farm product*	*Domestic final demand (a)*	*Gross national expenditure*
ANNUAL ($ MILLION)									
1990-91	368,874	368,739	367,019	370,863	365,213	354,102	14,637	363,975	362,805
1991-92	371,678	370,248	374,048	370,738	364,563	356,440	13,809	368,437	366,118
1992-93	384,484	382,591	387,808	383,054	374,266	367,961	14,630	379,684	380,360
1993-94	402,095	401,451	403,935	400,900	390,926	386,419	15,032	393,253	394,241
1994-95	419,745	420,838	418,812	419,586	413,156	409,055	11,783	416,960	419,214
1995-96	436,822	437,264	436,932	436,270	433,085	422,514	14,750	431,539	433,203
1996-97	448,688	450,575	446,762	448,727	451,849	433,597	16,978	446,989	444,803
PERCENTAGE CHANGE FROM PREVIOUS YEAR									
1990-91	- 0.4	- 0.7	- 0.3	- 0.2	- 1.7	- 1.0	7.1	- 1.5	- 3.1
1991-92	0.8	0.4	1.9	0.0	- 0.2	0.7	- 5.7	1.2	0.9
1992-93	3.4	3.3	3.7	3.3	2.7	3.2	6.0	3.1	3.9
1993-94	4.6	4.9	4.2	4.7	4.5	5.0	2.7	3.6	3.6
1994-95	4.4	4.8	3.7	4.7	5.7	5.9	- 21.6	6.0	6.3
1995-96	4.1	3.9	4.3	4.0	4.8	3.3	25.2	3.5	3.3
1996-97	2.7	3.0	2.2	2.9	4.3	2.6	15.1	3.6	2.7

Source: ABS (1998), May, p. 8.

Phases of the business cycle

We can identify four phases of the business cycle: contraction, trough, expansion, peak. Figure 6.6 shows a hypothetical, idealised version of the business cycle:

Figure 6.6: Phases of the business cycle



Source: Waud et al. (1996), p. 553.

Actual business cycles are not nearly as regular or periodic as this idealised version as your answer to Question 6.7 should reveal. The real-world business cycles are more accurately referred to as business fluctuations because each one is so different. It is often not very clear when the economy is passing from one phase to another.

In gathering data to measure business cycles, statisticians make seasonal adjustments. This means they manipulate the data in such a way as to remove the effect of regular variations in the level of economic activity which arise due to particular customs, or weather conditions, over the course of a year.

The period of contraction and trough can be so severe that they may be called a depression. But periods of contraction that are not so severe are called recessions. The official definition of a recession is a decline in the rate of growth of real GDP for two successive quarters.

In recent years in Australia, the amplitude (peaks and troughs) of the business cycle has been reduced, and the periodicity (peak to peak) has been quite regular. There is much debate as to why the business cycle has behaved in this way. It may be as a result of conscious policy decisions by the government; it may be due to changing world economic conditions; or it may be merely the result of changes in the way in which data is collected and the quality of that data (McTaggart et al. 1996, p. 513).

Factors determining the business cycle

The level of output, rate of inflation and rate of unemployment are constantly being moved around by shifts in aggregate supply and aggregate demand. The economy generally responds sluggishly to these disturbances which impact upon different industries and sectors of the economy in different ways. Business cycles are, to some extent, a reflection of the internal features of an economy, e.g. the structure of its industry and the types of products produced, the competitiveness of its markets, and the interactions between all its industries. In addition, many exogenous (external) factors, such as population growth or technological change, can be sources of fluctuation in the level of economic activity, as well as changes in consumer and business confidence. Of these internal and external factors, what then appears to be the major forces driving the business cycle. As you will see in the next reading, Begg et al. (2000) posits that, in theory, investment is the major factor.

☐ *Read Section 31-2 in Begg et al. (2000), pp. 528–30.*

Investment spending

As you would have gathered from your reading, we determine why domestic business cycles occur (leaving aside international factors at present) by looking, in the first instance, to the demand side of the economy. Consumption is a relatively stable component of aggregate demand, but investment expenditure is inherently volatile. We have already discussed in Topic 5 how investment decisions are based on expectations about future profits. Estimates about future levels of sales and real output are important in estimating future profits. As Begg et al. (2000) writes, other things being equal, higher expected future output is likely to raise expected future operating profits and increase the benefit to be derived from a marginal addition to the current capital stock (Begg et al. 2000, p. 528).

This *accelerator principle* indicates that it takes accelerating output growth to increase the level of planned investment. Firms will respond to changes in output if they believe that the output growth will be sustained and it is not too costly to adjust. Then, once output growth has stabilised, investment will have to fall in subsequent periods, ceteris paribus. The economy may then move into a recession until the rate of output growth picks up again, and investment will again increase. If investment decisions are made on the basis of past output growth, it is clear that the level of economic activity will fluctuate. The less firms' investment decisions respond to the most recent change in past output, the less pronounced will be the business cycle (Begg et al. 2000, p. 529).

Question 6.8

(a) Which of the following factors might be expected to affect the level of investment:

  (i) Past profitability.

  (ii) The present value of future operating profits.

  (iii) Real interest rates.

  (iv) Expectations about future sales.

  (v) Past output growth.

(b) How might a combination of some of these factors give rise to a business cycle?

Shocks

Another explanation for business cycles is that the economy is affected by real shocks (e.g. advances in technology, changes in government policy) which alter the complex production and expenditure plans of firms and households. This *real business cycle* view maintains that fluctuations in economic activity are random and unpredictable. The shocks are exogenous (external) and generally impact on the supply side of the economy. It is uncertain how quickly and efficiently the economy can respond to these supply-side shocks. Often, they do not seem to have immediate effects and it may take many years for major innovations or policy changes to be absorbed in the economy. Now, consider the following section of the text for a discussion on the 'real business cycle' approach.

☐ *Read Section 31-3 in Begg et al. (2000), pp. 531–3, for a discussion on the 'real business cycle' approach.*

Economies are subject to fluctuations in the level of economic activity. These fluctuations may be the result of variations in one or more of the components of aggregate demand, aggregate supply, or may be simply due to political factors. In a dynamic and complex economy it is difficult to provide definitive arguments about how and why economic activity fluctuates in a cyclical fashion. The cycles may have developed as a persistent response to a particular shock. Given this uncertainty about the trend path of the economy, governments should be wary of intervening to try to stabilise the level of economic activity. If the economy is following a trend path, albeit a cyclical one, then intervention is not only pointless, but may exacerbate the position by providing additional shocks to the system.

If we accept that the economy does follow a cyclical trend, then business managers would be keen to know when an economic expansion is likely to peak, or when the economy is going to pull out of a recession. Consequently, good and accurate economic forecasting has become a highly valued skill.

Forecasting and economic indicators

Business decision makers are faced with much uncertainty when making important production and investment decisions. Consequently, in an attempt to reduce this uncertainly, firms often devote resources to forecasting. Good forecasting is essential to reduce the uncertainty of the environment in which most managerial decisions are made.

Forecasting involves predicting future economic conditions and assessing their effect on the operations of the firm. The objective of the forecasts may be to estimate demand, production costs, selling prices, or to determine the proper product mix and market share. Forecasts at the firm level depend on the performance of the overall economy, therefore information on key macroeconomic variables must be gathered and interpreted. Forecasting the future macroeconomic environment is complex and requires the use of a variety of techniques. In this section we shall look at different forecasting techniques, evaluating their strengths and weaknesses.

The first requirement for an accurate forecast is a good set of data. Important sources of data are expert opinion, surveys and market experiments. However, in economics, empirical data on particular economic variables is usually collected as a *time series,* i.e. a series of observations at different points in time. Alternatively, the data may be *cross-sectional,* i.e. an array of the values of economic variables observed at the same time.

Time-series forecasts assume that future patterns in the series may be predicted by projecting from past data. In making such projections, economists then realised that it was possible to isolate sets of time series that showed a close relationship. A time series that is correlated with another time series is sometimes called an indicator of the second series. Economists are always interested in finding good indicators of economic trends. These *barometric* forecasts are used primarily to identify potential future changes in general business conditions, rather than for specific industry or firm forecasts.

Economic indicators may be classified as leading, coincident or lagging, and there is a long list of indicators that are useful to business analysts and forecasters. A useful leading indicator must be accurate, provide adequate and constant lead times, involve a logical explanation as to why one series predicts the other, and be available at reasonable cost. A *composite index* is a weighted average of several leading indicators (Petersen & Lewis 1994, p. 163).

☐ *Reading 6.2 'Composite leading indicator' shows how this indicator in Australia is constructed. Consider this reading now and note the interpretation and predictive ability of the CLI.*

The main value of leading and lagging indicators is in predicting the *direction* of future change in economic activity. They do not reveal a great deal about the *magnitude* of the changes. This is due to the fact that we are dealing with human behaviour. It is often difficult to know why consumers do what they do, and why producers change their production plans. Economists do not pretend to have any particular insights into the psychological and sociological make-up of economic agents.

Indicators are rated according to their performance in the following areas:

1. Overall economic significance.

2. Statistical adequacy.

3. Conformity with the direction and magnitude of changes in the level of economic activity.

4. Currency in the availability of data.

5. Consistency with respect to turning points in economic activity.

Table 6.2 gives a shortened list of the main series in each indicator category, as used by the U.S. Department of Commerce. The reasoning behind the use of many of these indicators is because they represent commitments to future levels of economic activity, e.g building permits precede building starts. However, the value of any particular indicator depends on the accuracy of the predictions, consistency in the length of the lead or lag, and the lack of large random or seasonal fluctuations.

Table 6.2: Indicator series by category

INDICATOR	MEAN LEAD (-) OR LAG (+) IN MONTHS	STANDARD DEVIATION	OVERALL SCORE
Leading indicators (12 series)			
Average weekly hours of production or nonsupervisory workers, manufacturing	-6.3	6.1	75
Average weekly initial claims for unemployment insurance, State programs	-7.3	8.4	77
Manufacturer's new orders in 1972 dollars, consumer goods and materials industries	-6.7	6.9	72
Vendor performance, percent of companies receiving slower deliveries	-6.5	5.7	80
Index of net business formation	-7.3	7.2	72
Contracts and orders for plant and equipment in 1972 dollars	-3.9	5.4	70
Index of new private housing units authorized by local building permits	-10.1	7.7	78
Change in manufacturing and trade inventories on hand and on order in 1972 dollars, smoothed	-6.3	5.8	73
Change in sensitive materials prices, smoothed	-7.3	6.8	66
Index of stock prices, 500 common stocks	-6.9	3.3	85
Money suppply M2 in 1972 dollars	-10.9	7.4	69
Change in business and consumer credit outstanding	-7.1	7.0	71
Roughly Coincident Indicators (4 series)			
Employees on nonagricultural payrolls	+.9	3.4	87
Personal income less transfer payments in 1972 dollars	-.6	1.0	82
Index of industrial production	-.6	2.7	84
Manufacturing and trade sales in 1972 dollars	-2.3	2.6	74
Lagging Indicators (6 series)			
Average duration of unemployment in weeks	+4.4	6.3	86
Ratio, manufacturing and trade inventories to sales in 1972 dollars	+13.4	9.8	70
Index of labor cost per unit of output, manufacturing—actual data as a percent of trend	+10.5	6.1	75
Average prime rate charged by banks	+12.2	15.1	88
Commercial and industrial loans outstanding in 1972 dollars	+6.8	6.9	79
Ratio, consumer installment credit outstanding to personal income	+4.4	5.3	79
Composite indexes			
Twelve leading indicators	-6.6	5.7	75
Four roughly coincident indicators	-.8	2.0	83
Six lagging indicators	+7.6	4.1	78

Source: US Department of Commerce, Bureau of Economic Analysis, *Handbook of Cyclical Indicators* (Washington, D.C.: U.S. Governmant Printing Office, May 1984).

Source: McGuigan & Moyer (1993), p. 199.

Question 6.9

(a) Could the lead time necessary for an indicator to be useful in forecasting be longer in one industry than in another? Give an example.

(b) The average work week is considered a leading indicator of general economic activity. Would longer workweeks predict an upturn or a downturn in economic activity? Explain.

Economists face a stabilisation problem—how to control and minimise business cycle fluctuations, keeping both unemployment and inflation low, while maintaining strong long-term, sustainable growth. We now look at the way in which government and policy makers choose to implement various policies in an attempt to achieve their objective of stabilising the economy.

Macroeconomic policies

Economic policy seeks to resolve current economic problems such as high unemployment, increased foreign indebtedness and the slowdown in productivity growth. Macroeconomic policy is often referred to as stabilisation policy for one of the major aims is to reduce fluctuations in the level of economic activity.

In our study of macroeconomics, we have developed the analytical framework of aggregate demand/supply and national income/expenditure to show why the national economy is operating at a certain price/output level. We shall now outline the policy alternatives that are available to policy makers as they seek to stabilise the economy and maximise economic welfare.

Policy makers draw on macroeconomic theory to identify the impact variables they wish to influence and to determine the extent to which various policy instruments will be manipulated ('pulling the economic levers'). In reality, policy is conducted under conditions of uncertainty. We need to understand the inherent nature of the variables we seek to manipulate, and these variables must be controllable by policy instruments if the policy is going to be effective.

Policy alternatives

The complexity of the aggregate economy makes it difficult to understand and, therefore, very difficult to predict trends. As a result, macroeconomists disagree on many issues. There is much disagreement about the answers to the following questions:

- How quickly do prices and wages adjust to bring about 'full employment' of all resources?
- Is long-run equilibrium unique?
- How are expectations formed?
- What is the relative importance of the short run and the long run?

☐ *Read the introduction to Chapter 32 and Section 32-1 in Begg et al. (2000), pp. 536–41, for a discussion of these major areas of disagreement.*

The major schools of thought in macroeconomics approach these questions differently and come up with different policy recommendations. Begg et al. (2000) highlights the main policy options and constraints open to the government in Chapter 32 (see Box 32-2, p. 532).

☐ *Read sections 32-2 to 32-6 in Begg et al. (2000), pp. 541–6.*

The competing views of macroeconomists are summarised in Table 32.1 on p. 546. Why should there be disagreements between economists? Some can be understood by recalling the distinction between positive and normative statements, first introduced in Chapter 1 of Begg et al. (2000). It is perfectly possible for two economists to agree about the nature of a problem facing an economy, to agree about the theoretical analysis of the problem, yet to disagree about the appropriate policy response. This arises simply from differing value judgements about the proper objectives of policy. However, it is clear that some disagreements go beyond this, because they extend to views about how the economy operates. This is inevitable in a subject that is unable to prove theoretical concepts in laboratory experiments. Economic data is open to alternative interpretations, and many of the variables we require are unobservable or difficult to measure.

Question 6.10

The old joke says that if you were to line up all the economists in the world, they would never reach a conclusion. Which of the following statements may help to explain why economists sometimes disagree?

(a) Judgements about the relative cost to society of ills like unemployment and inflation involve normative issues on which economists may differ, even if they agree about positive economic theory.

(b) Economists cannot carry out laboratory experiments that enable theories to be proved true or false.

(c) We do not have enough data to allow more than tentative evidence to be presented.

(d) It is not clear whether markets clear, or how quickly they clear.

(e) We cannot precisely define the process of expectations formation in the real-world economy.

The macroeconomic debate has been outlined by other economists as a choice between the policy prescriptions of restrictionists, expansionists, or supply-siders (Indecs Economics 1992). We shall look at each of these alternatives separately.

- *Restrictionists* give top priority to fighting inflation. Their policy prescription is to restrain growth in order to dampen excessive aggregate demand and limit wage claims. If there are any 'real' shocks, restrictionists argue that the best role for economic policy is to hold things steady until the economy has a chance to adjust. Readjustment is both necessary and vital, and it will best be achieved by allowing all markets to work freely. This is likely to result in increased productivity and international competitiveness.

- *Expansionists* seek a more active, interventionist policy by government. They believe the adjustment process is too slow and therefore propose alternative methods of direct intervention in terms of wage and price setting, increased government expenditure on infrastructure, greater assistance for industry and reduced taxation. By such manipulation of aggregate demand, the expansionists aim to 'fine tune' the economy and improve performance.
- The *supply-siders* believe that too much attention has been given to the control of spending. The problems that arise could be more adequately dealt with by increasing supply and/or removing constraints to supply. Therefore, the policy measures suggested by the supply-siders involve deregulating industry and increasing incentives for firms and workers via reduced taxation. They argue that lower marginal tax rates increase the economy's capacity to supply output by providing higher after-tax rewards, which may increase work effort and profit expectations. Deregulation should increase competition and lower prices (Waud et al. 1996, p. 857).

(You might like to think of particular media commentators and/or individuals responsible for economic policy who would fit into each of the above categories.)

Macroeconomic policy alternatives have important implications. The important question is whether the economy is essentially stable and self-correcting when it gets off track, or is it essentially unstable and in need of corrective action. In order to determine the appropriate policy, governments and their economic advisers must assess the performance of the economy, the likely impact of current policy settings and the pattern of the trend growth rate. They rely heavily on the prompt collection of accurate data, and the use of various forecasting techniques.

Question 6.11

(a) How would an expansionist respond to the criticism made by restrictionists regarding the tendency for any wage indexation system to perpetuate whatever the starting rates of inflation happen to be?

(b) Why did supply-side economics gain prominence following the oil price shocks of the 1970s?

☐ *You are now in a position to tackle Reading 6.3 'Overview of economic developments'. In reading this article, concentrate on the Australian section (p. 6 onwards), and try to determine the current state of the Australian economy. Summarise your views and make a prediction as to the likely future direction of the economy over the next year. Note that this article was written in November 1996. You are no doubt reading it at least a couple of years later. Have you been aware of any significant changes to any of the economic variables mentioned in the article?*

Summary

In this topic we developed an aggregate demand and supply framework within which we can analyse macroeconomic issues. Aggregate supply is a very debatable subject in macroeconomics and no two textbooks are likely to discuss it in the same way. We identified the expected price level as a key determinant of the resource prices that influence aggregate demand in the short run. In the long run, firms may fully adjust to unexpected changes in the price level and the economy may produce at its potential, or full employment, output.

The business cycle was described and determinants discussed. Finally, we looked at the policy alternatives facing governments and highlighted the important differences between various policy approaches.

We now need to return to the microeconomic analysis of the economy. Our macroeconomic policies are not able to be successfully formulated if we do not appreciate the way in which decisions are made at the firm level. The most crucial decision business managers generally make is: 'How much will we produce?' and 'At what price shall we sell our product?'. The next topic 'Production and costs' will provide you with some important insights into this aspect of business decision making.

Review questions

Review question 6.1

What determines shifts in the aggregate demand and aggregate supply curves, and how can these lead to a recession?

Review question 6.2

Why do production costs rise when actual output exceeds potential output?

Review question 6.3

(a) Discuss the proposition that the best stabilisation policy is one of non-intervention.

(b) If intervention is desirable, what are the different economic policy instruments that are available to government?

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Suggested answers

Topic 6

In-text questions

Question 6.1

(a) Some costs, (particularly long-term labour costs) are stable in the short run, so production costs rise less than the actual price level. Hence, the extra revenue from an additional unit of output rises above the extra cost of producing an additional unit, and expanding output generates higher profits. The firm expands output to obtain the higher profits.

(b) Costs increase when output exceeds potential output. This is because the increased demand for resources drives up any resource prices that are not set by contract. Furthermore, the firm must offer higher nominal wages to get new workers to come to work or pay overtime wages to get current workers to work more hours.

Question 6.2

(a) A short-run aggregate supply curve is drawn for a given expected price level in a given wage-contract period. If the actual price level equals the expected price level, actual output equals the potential output. If actual prices exceed expected prices, firms expand production because the prices of their products increase relative to costs (given that some resource costs are fixed). As production expands, costs begin to rise. Consequently, the increased output is accompanied by higher prices. If actual prices are lower than expected prices, the opposite occurs. Product prices fall relative to costs, so firms respond by curtailing production. This generates lay offs and unemployment. Output and costs of production fall, and the reduction in output is accompanied by lower prices. Consequently, the short-run aggregate supply curve slopes upwards.

(b) The long-run aggregate supply curve is vertical at the level of potential output. The potential output is determined by the level of technology and the amount of resources available for production. Resource owners determine how much to supply to the market on the basis of expected real resource prices. Regardless of the overall price level, these expected real resource prices will be attained once all markets clear. Consequently, the potential output does not depend on the actual price level; i.e. in the long run the economy will produce its potential output, so the long-run aggregate supply curve is vertical.

Question 6.3

(a) This factor affects the workers' willingness to become unemployed and discourages adjustment.

(b) In the absence of a redundancy agreement, firms may be more willing to make adjustments to the size of their workforce.

(c) This may encourage adjustment as firms have less need to 'hoard' unskilled labour.

(d) This may discourage firms from adjusting employment and wage rates, as there is flexibility in labour input without needing to negotiate a new wage deal or indulge in hiring and firing. However, in the long run such adjustments may have to be made.

(e) This also discourages firms from making adjustment to employment and wages.

(f) If labour is scarce, firms may not be able to increase employment, and may be reluctant to lose workers. Workers may be more prepared to change jobs as they will perceive that it will not be difficult to find new jobs.

(g) Firms may wish to hold on to trained labour if demand falls temporarily Workers may recognise that their skills are not readily transferred to other firms.

Question 6.4

(a) Supply shocks are unexpected events that affect aggregate supply. For example, droughts, floods, shortages of raw materials.

(b) Supply shocks often only have a temporary effect. For example, a drought causes the short-run aggregate supply curve to shift but does not affect the long-run aggregate supply because it does not affect the economy's potential output.

(c) Supply shocks with more permanent effects, such as a sharp increase in wages, or a significant increase in the cost of an essential input (e.g. oil) or a technological breakthrough generate changes in the long-run aggregate supply curve and in potential output.

Question 6.5

(a) An increase in supply, increasing potential output.

(b) A decrease in supply. Refer to Begg et al. (2000), pp. 437–8, particularly Figure 26-11.

(c) This increases autonomous investment demand so represents an increase in demand.

(d) A (short-run) decrease in supply.

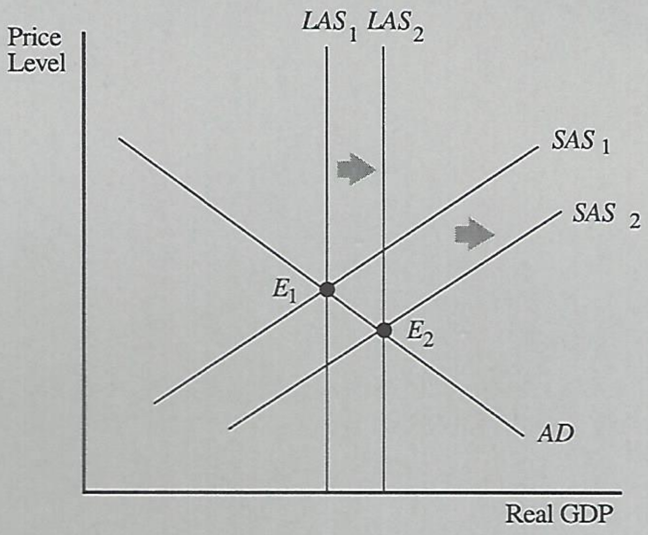
(e) A decrease in demand.

(f) Given the differing propensities to consume of the 'rich' and the 'poor', this leads to an increase in autonomous consumption and in aggregate demand.

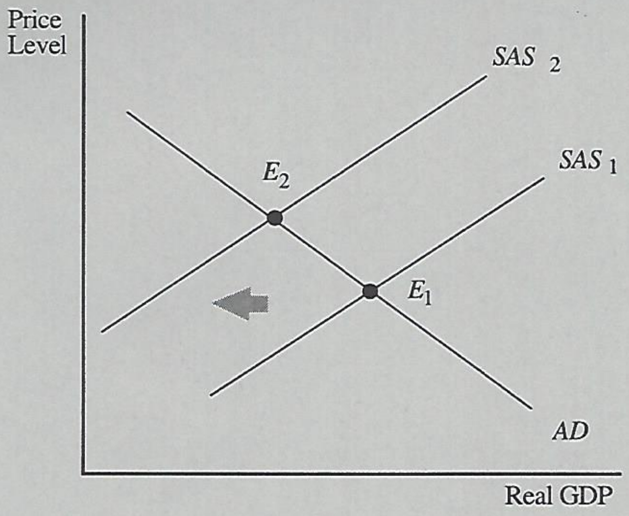
(g) This represents a fall in labour supply at any given real wage, so there is a reduction in supply and potential output.

Question 6.6

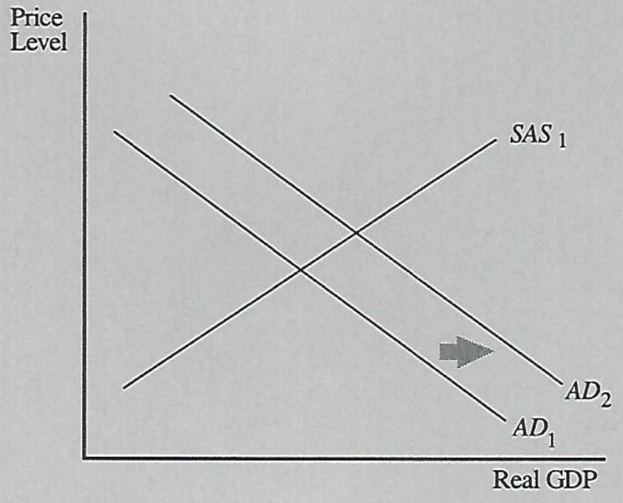
(a) If OPEC was wound up, we would expect oil prices to drop as producers tried to gain market share. This may result in a decrease in the general price level, therefore the AS curve would shift outwards, to the right. Lower prices also lead to a movement along the existing demand curve.



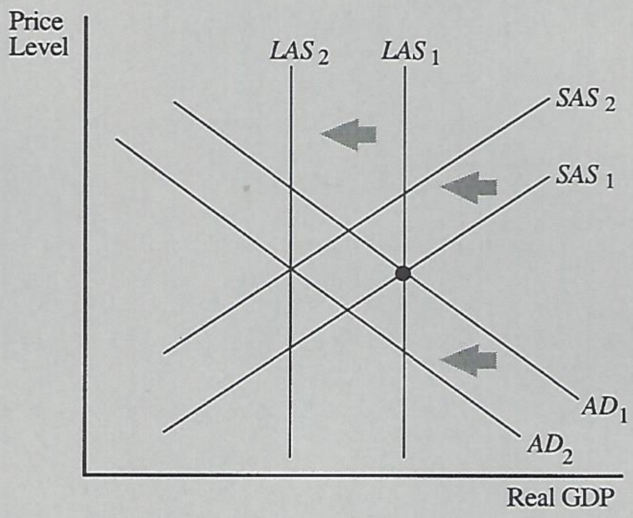
(b) Severe drought would lead to crop failures and this may result in higher food prices. *AS* would shift upwards, to the left.



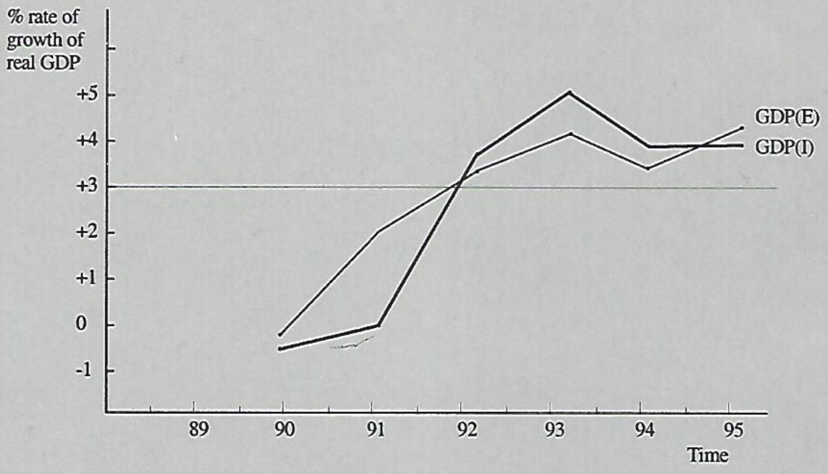
(c) Increased government expenditure shifts the *AD* curve to the right. The effect on the price level depends on where the *AD* curve now intersects the *AS* curve. Generally, such a shift in *AD* will lead to an increase in the price level if *AS* has not changed.



(d) Cutting back migration and government spending would shift both the *AD* and *AS* curves inwards, to the left. Price level would increase and real GDP would be reduced.



Question 6.7



Question 6.8

(a) All of these factors affect the investment decision to some degree. (b) is, of course, crucial in investment decision making. Indeed, we might argue that the other factors listed all have some influence on the way in which firms will perceive (b). Some also affect the cost of borrowing: for instance, it may be less costly to finance investment from past profits than by borrowing in the market. However, ultimately it is firms' expectations about the future which will be most important.

(b) The multiplier-accelerator principle shows that if firms form expectations (factors (b) and (d)) with reference to past output growth (factor (e)), then cycles in activity may be generated.

Question 6.9

(a) Yes. The necessary lead time may be very long in some industries—for example, it would not be useful to predict changes in demand for steel by one week because it takes a long time to put idle steel furnaces into operation—whereas in other industries the necessary lead time is much shorter—for example, production processes where workers can work overtime, or extra shifts can be put in place in response to a predicted increase in demand.

(b) Longer average workweeks would predict an increase in manufacturing output. This would be likely to result in an upturn in economic activity—employers may be utilising existing labour resources more fully, and some people, previously unemployed, may have gained work.

Question 6.10

All of them. See Section 32-1 in Begg et al. (2000).

Question 6.11

(a) Expansionists believe that inflation is the result of conflict over the distribution of GDP, particularly the relative shares to business and labour. They do not agree with allowing the economy to wallow in long periods of recession in order to break the back of inflation. This is a costly procedure and largely ineffectual. They support the use of an incomes policy and therefore the use of wage indexation. Their policy prescription is to encourage output to expand even more. They have not been able to satisfactorily rebut the claim that wage indexation perpetuates inflation at the starting rate and reinforces inflexibility in the labour market.

(b) The oil price shocks of the 1970s highlighted the supply side of the economy. It was recognised that factors influencing the supply side of the economy (such as the price of essential inputs) have a significant impact. The oil price increases were a direct result of industrial concentration and lack of free market competition on a global scale. Supply-siders argue against regulation by claiming that governments should follow policies that promote international competitiveness and open markets.

Review questions

Review question 6.1

Shifts in aggregate demand are due to changes in expenditure patterns, e.g.

- consumer purchases of durable goods;
- investment demand (particularly inventories and construction expenditure);
- net exports (as a result of pressures in international markets);
- government expenditures (usually undertaken in an attempt to stabilise the economy).

The consumption and investment expenditures may change due to changes in interest rates, expectations or availability of credit.

A shift of aggregate demand to the right (left) means that at each an every price level, there is a higher (lower) level of aggregate demand.

A shift in the aggregate supply curve to the right means that at any given price level firms are willing to supply more. This may be due to improvements in technology and productivity, or a decrease in the price of inputs. Firms may supply less at each price level due to natural or man-made disasters, an increase in economic uncertainty, or an increase in the price of inputs.

Shifts in *AD* or *AS* can lead to a recession. If *AD* remains constant and the *AS* shifts upwards, the equilibrium level of output will be lower. If *AS* remains constant and the *AD* shifts to the left, this will also result in decreased production.

Review question 6.2

Costs increase when output exceeds potential output. This is because the increased demand for resources drives up any resource prices that are not set by contract. Also, a firm must offer higher nominal wages to get new workers to come to work or pay overtime wages to get current workers to work more hours.

Review question 6.3

(a) This proposition rests on the belief that the economy will stabilise itself within a reasonable time span if left alone. Non-interventionists believe that the economy operates efficiently, and at, or near, the full employment level. They consider the economy will respond fairly quickly to any external shocks. Consequently, government intervention is unnecessary. In addition, it may be argued that misguided or mistimed policy action may, in actual fact, have a destabilising effect.

(b) Interventionists believe that periods of persistent unemployment are evidence that the economy does not adjust quickly, and government policy should be used to stimulate the economy. Policy instruments that can be used include:

- Fiscal policy—taxes, transfer payments, subsidies, industry assistance, research and development grants, tariffs and import quotas.
- Monetary policy—changes in interest rates, the money supply, or exchange rates.

Influences on aggregate demand and aggregate supply

Reading 6.1

Stephen Ellis

Govt aims to hold growth at 4pc with Budget cuts

The Federal Government wishes to rein back economic growth to about 4 per cent, and in order to achieve this will pay 'intense attention' to cutting outlays in the Budget, a senior minister said in Parliament yesterday.

The Government's Senate leader, Senator Evans, nominated the figure as a sustainable rate of expansion and said a tighter fiscal stance was the best way to deal with the nation's current account and savings constraints.

'We want that growth to be sustained at around 4 per cent if we possibly can,' he said. 'We are concerned to ensure that the recovery in the economy—the growth in the economy—is sustainable.'

This, Senator Evans said, had placed a heavy weight on fiscal policy.

'To that extent we do need some intense attention paid to the fiscal side of the equation and we will be doing that in this Budget. The primary emphasis in that fiscal policy approach being a reduction in outlays.'

Senator Evans also said that the Government hoped to avoid lifting interest rates further.

'If we can avoid interest rate increases, obviously we would want to do that. The truth of the matter is ... that we don't exclude them but nor do we see them as likely for the foreseeable future.

'Of course, I'm not ruling them out and no responsible government would.'

Senator Evans' comments came as Cabinet's Expenditure Review Committee continued with the task of pruning expenditure and as a leading index of economic activity pointed to a slowing of growth in coming months.

The leading index, prepared by Westpac and the Melbourne Institute of Applied Economic and Social Research, fell 0.7 per cent in January to be 2 per cent below its peak last August.

The index gives a rough indication of where the economy will be in six months' time, taking into account factors such as dwelling approvals, telephone connections, the amount of overtime worked, share prices, company profits, the money supply and the cost of materials used in manufacturing.

Sharp falls in dwelling approvals were the dominant influence in the latest month, according to Mr Nigel Stapleton, Westpac's acting chief economist.

Mr Stapleton said the rapid pace of economic growth in late 1994 appeared to be fairly resilient in the early part of 1995, but the leading index pointed to a moderation later in the year.

He said the effects of the three tightenings of monetary policy in 1994 would begin to flow beyond the housing sector, affecting demand for other cyclical consumer industries such as whitegoods and furnishings.

'However, given the strength of the coincident index, any moderation is coming off high levels of growth and the pressure is still on the Government to have fiscal and monetary policy working to slow that growth to a more sustainable pace,' he said.

Australian Financial Review, 23 March 1995

Essence of the story

- The government wants to hold economic growth for the year 1995 to 4 per cent.
- A growth rate of 4 per cent is deemed 'sustainable', as growth rates above 4 per cent a year add to inflationary and current account pressures.
- The current focus of the government's policy is fiscal policy —its choices of government expenditure and taxation. The government is looking for ways to reduce expenditure.
- Past policy emphasis was on monetary policy, with three increases in interest rates during 1994.
- A leading indicator of economic growth suggests that the economy's growth rate is already slowing.

Analysis

- Figure 1 shows the current situation. Aggregate demand is shown by the aggregate demand curve AD_0, and short-run aggregate supply is SAS_O. The macroeconomic equilibrium is at point a, where the AD curve intersects the *SAS* curve on the long-run aggregate supply curve, LAS_0. The economy is in a full employment equilibrium. Real GDP is $400 billion, and the price level is 110.
- Sustainable growth means that, given growth in aggregate inputs capital and labour, the long-run aggregate supply curve will shift to LAS_1, where full-employment real GDP has grown by 4 per cent. The short-run aggregate supply curve moves with the LAS curve.
- The government believes that aggregate demand will grow faster, to AD_2. If this occurs, the economy will move to an above-full employment equilibrium at point b. Real GDP rises by 5 per cent to $420 billion, and prices begin to rise.

- To ensure that growth is not too fast, the government wants to cut back its own expenditure, G. This directly reduces aggregate demand. With an appropriately tight fiscal policy, the aggregate demand curve shifts to AD_1, and macroeconomic equilibrium occurs at point c. The economy remains in a full- employment equilibrium.
- The only possible problem is that, because of the tighter monetary policy in 1994, the rightward shift of the aggregate demand curve has already slowed to sustainable levels. A further tightening of fiscal policy on top of this could lead to the economy arriving in an unemployment equilibrium shown in Figure 2 at point d.

Conclusion

- The aggregate demand-aggregate supply model is a useful tool for analysing the changes that occur in the economy.
- Demand management policies, using fiscal policy and monetary policy to fine-tune the position of the aggregate demand curve, require detailed and extensive knowledge of where the economy currently is, and of where it is going.

Figure 1

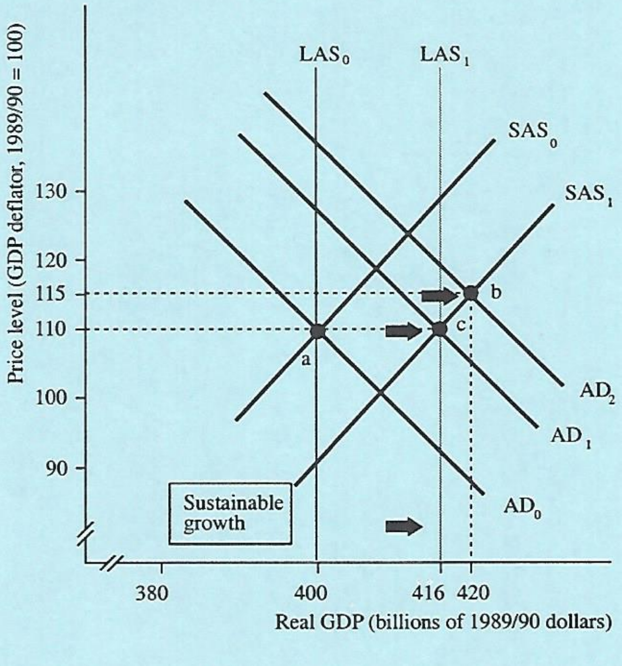
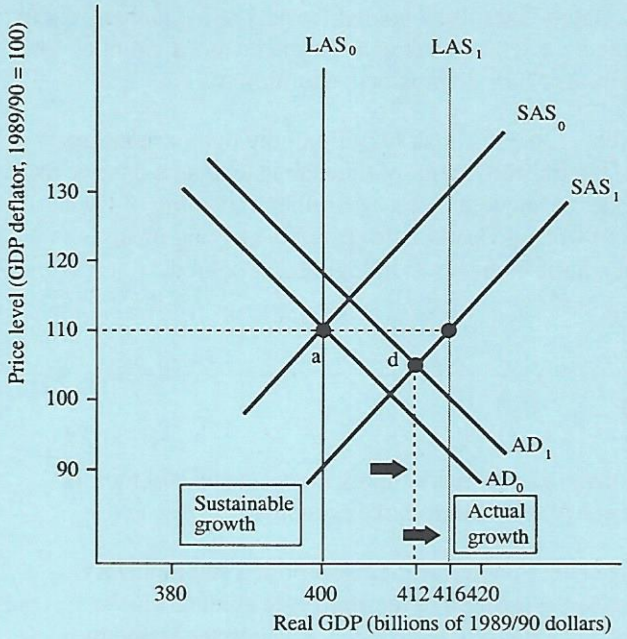


Figure 2



Source: McTaggart, D., Findlay, C. & Parkin, M., *Economics,* 2nd edn, Addison-Wesley, Sydney, 1996, pp. 578–9.

Composite leading indicator: September quarter 1996

Reading 6.2

In the September quarter 1996 the experimental Composite Leading Indicator (CLI) rose 0.18 per cent, following a 0.31 per cent rise in the June quarter 1996. The CLI is showing a trough at the September quarter 1995 followed by strong growth. Of the eight components used in its compilation, five made positive contributions, while three made negative contributions to the change in the September quarter 1996 CLI. The largest positive contribution to the change in the September quarter 1996 was from the inverted lagged real interest rates, while the largest negative contribution was from job vacancies.

The reference series for the CLI is the deviation of the quarterly trend growth rate in GDP(A) from its historical long-term trend growth rate. This series had a trough in the June quarter 1995; trend GDP(A) then rose above the historical long-term trend until the March quarter 1996. In the June quarter 1996, trend GDP(A) turned back towards the historical long-term trend.

The last cycle in GDP(A) largely reflected the effects of the drought on the farm output in GDP(A). Since there is no rural production component in the CLI, the last cycle in GDP(A) was not well predicted by the CLI. However, the effects of the drought followed by good seasons, feed into the rest of the economy given time, which might be the reason for the slowness in the CLI picking up that particular cycle, relative to its historical performance. The ABS has investigated including a rural production component in the compilation of the CLI to pick up cycles of this sort in the future. However, it was found that at most turning points, rural production either lagged or was coincident with GDP(A). The last time the rural production series led GDP(A) was a peak in the December quarter 1983, coming out of the drought in the early 1980s. Thus, including such a rural indicator in the CLI tends to reduce the CLI's predictive performance overall.

Background

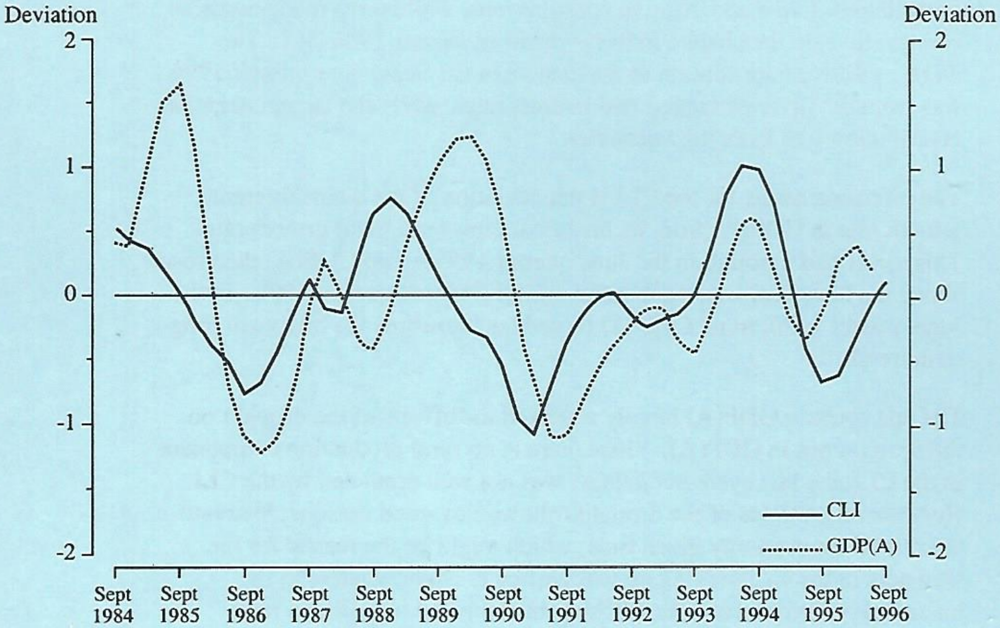
The CLI summarises the early signals contained in a selection of economic indicators and is designed to assist the early detection of turning points between successive expansions and slow-downs of economic activity, as measured by constant price GDP(A). The CLI has been developed to supplement, rather than to compete with, existing forms of economic analysis and forecasting. The CLI is still considered to be experimental and it will be updated in the Australian Economic Indicators each quarter during the experimental period.

Interpretation

Expansion and slow-downs in activity are measured relative to the historical long-term trend; thus, peaks and troughs in the CLI provide early signals of turning points in the growth cycle, not signals of recessions and recoveries.

Based on past performance of the CLI, the continued growth of the CLI through September 1996 would signal that the downturn in GDP(A) trend growth for the June quarter 1996 is unlikely to be sustained, and growth in GDP(A) above long term trend levels would be indicated for the coming three to six months.

Graph 1: Composite Leading Indicators (CLI) and GDP(A) deviation from historical long-term trend



Note: In the June quarter 1996, the quarterly long-term growth rate of GDP(A) is 0.88 per cent and trend growth rate is 0.68 per cent.

Predictive performance

The CLI is calculated as a simple average of the short-term movements in eight indicators, selected on the basis of their having provided early signals of turning points in the growth cycle during the 1970s and 1980s. Because the evolution of each expansion and slow-down in activity presents a unique combination of features, none of the individual indicators has had an unvarying or perfectly stable leading relationship with GDP(A). On average during the 1970s and 1980s, the CLI led turning points in the GDP(A) growth cycle by around two quarters, but the lead time for individual peaks and troughs varied considerably.

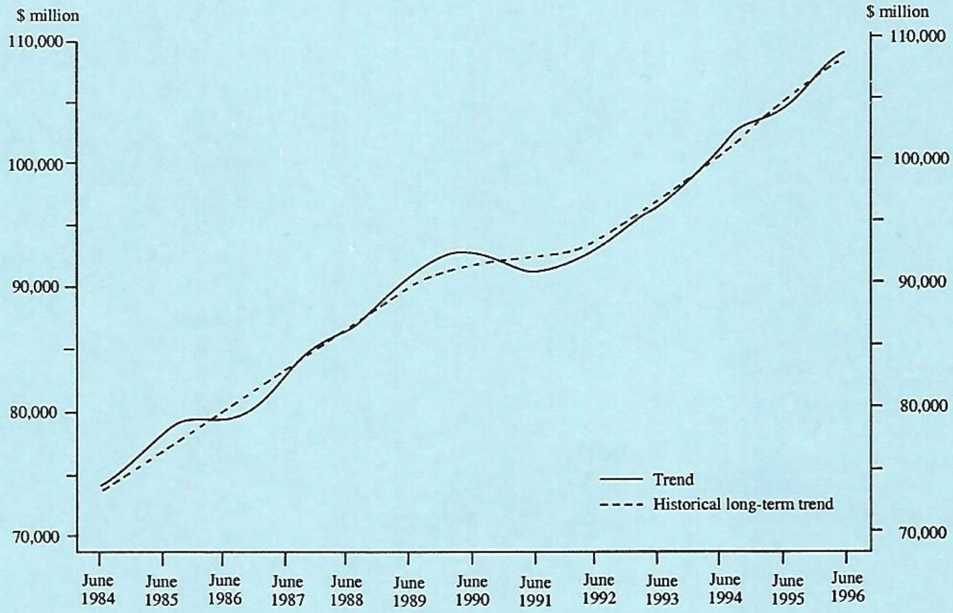
Graph 1 shows constant price GDP(A) and the CLI expressed as deviations from the historical long-term trend. Graph 2 shows trend

GDP(A) compared with its historical long-term trend; both series are showing quite strong growth during recent quarters. Table 1 shows the values of the CLI and its corresponding quarter-to-quarter changes. Table 1 also shows the recent values of the trend in GDP(A) and the long-term trend, along with the percentage deviation of trend GDP(A) from the long-term trend.

Table 1: CLI and GDP(A)—growth rates

	Jun 1995	Sep 1995	Dec 1995	Mar 1996	Jun 1996	Sep 1996
CLI Deviation from long-term trend	–0.43	–0.66	–0.60	–0.34	–0.04	0.14
Change from previous quarter		–0.24	0.06	0.26	0.31	0.18
GDP(A) Trend	104,343	105,585	106,940	108,035	108,768	NA
Percentage change from previous quarter		1.19	1.28	1.02	0.68	NA
GDP(A) Long-term trend	104,705	105,678	106,641	107,578	108,522	NA
Percentage change from previous quarter		0.93	0.91	0.88	0.88	NA
GDP(A) Deviation from long-term trend	–0.34	–0.09	0.28	0.42	0.23	NA
Change from previous quarter		0.26	0.37	0.14	–0.20	NA

Graph 2: GDP(A) at average 1989–90 prices



Source: Australian Bureau of Statistics, *Australian Economic Indicators,* Cat. no. 1350.0, ABS, Canberra, December 1996, pp. XV–XVI.

Economic outlook

Reading 6.3

This article provides an overview of economic conditions since the 1997–98 Budget.

The June quarter 1997 National Accounts confirmed that a step up in growth occurred in the first half of 1997, following a temporary slowing over the last three quarters of 1996. Gross Domestic Product (GDP) growth in the June quarter 1997 was driven by solid growth in private consumption, dwelling investment and a substantial contribution from non-farm stocks.

At the time of the 1997–98 Budget, faster economic growth was expected to result from stronger growth in private final demand combined with continued modest growth in public demand and a small detraction from growth from net exports. The recent indicators: are consistent with continued solid growth in business investment; point to a continuation of the housing recovery, underpinned by historically high levels of home affordability; and confirm a firming of employment growth, which will support household incomes and consumption. Lower than average rainfall across much of southern and eastern Australia during the winter months raised the risk that farm production may be lower than expected, however this risk appears to have been reduced for the time being with good September rains. Nevertheless, an El Nino event is still being predicted to March 1998, highlighting that uncertainty continues to surround the outlook for next year's winter crop.

The positive economic fundamentals which underpinned the step up in growth in the first half of 1997 have continued into the second half of the year: inflation at its lowest level since the 1960s; the impact of easier monetary conditions continuing to be felt; and both the household and corporate sectors in structurally sound positions. In particular, the recent interest rate reductions and the depreciation in the exchange rate since the Budget was handed down in May should provide a sizeable stimulus to activity in 1997–98. These influences will help to offset any emerging risk to activity from developments in Asia.

Recent financial market instability in East Asia has increased the degree of uncertainty surrounding the assumption for growth in that region. While it is too early to gauge the impact of recent financial market instability on economic activity in the region, it is likely that economic growth in East Asia will be lower than assumed at budget time. Outside East Asia, economic growth in the United States remains strong and growth continues to pick up in Europe.

Box 1 provides a summary of recent developments in the world economy.

Box 1: Recent developments in the world economy

Economic growth in the United States have averaged $4^1/_4$ per cent (annualised) over the past three quarters, well above the long-term trend. As a result, the unemployment rate has fallen further. At the same time, underlying inflation has continued to fall and there has not been any clear acceleration in labour costs. Recent indicators of activity have been somewhat mixed. Employment growth and consumer spending are expected to moderate and inventory investment to slow. Growth overall is expected to return to a more sustainable level in the year ahead. Should signs of inflationary pressures emerge, any tightening in domestic policy settings is likely to be moderate and any upturn in inflation is likely to be gradual.

The economic outlook for the **East Asian region** has weakened over the past few months with several countries in South East Asia experiencing large currency depreciations and weakening equity markets. Thailand, Indonesia, Malaysia and the Philippines (the ASEAN 4) have been affected. Together these economies account for around 10 per cent of Australia's merchandise exports and one fifth of the growth in exports over recent years. Our major trading partners in the region are in North Asia—Japan, Korea and Taiwan. A marked slowing in growth in these economies would have a greater impact on Australia. Weaker domestic demand can be expected in the ASEAN 4 in the short term as a result of lower levels of confidence, higher interest rates, exchange rate losses, strains on the financial system, and lower capital inflows. The prospects for these economies over the year ahead will be contingent upon measures to consolidate financial sector liberalisation and to tackle underlying structural problems. The effectiveness of policies to contain the inflationary impact of the currency depreciations will also be critical in the year ahead. Success on this front would help lock in competitiveness gains and underpin a rebound in exports and growth.

The underlying strength of the **Japanese** economy remains difficult to gauge because of the one-off impact of the 1 April increase in the value added tax rate. While growth in the first half of the year was less than expected, domestic demand is expected to rebound in the second half of the year. Policy settings are supportive with interest rates low, the impacts of fiscal consolidation easing and external demand likely to remain a positive force for growth. That said, downside risks remain, highlighting the importance of the domestic structural reform agenda.

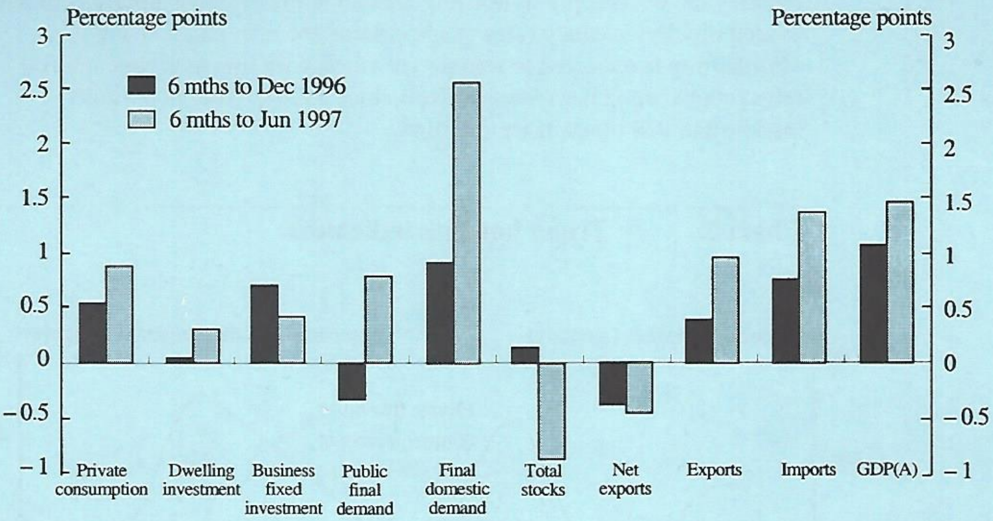
The economic outlook for **Western Europe** is for growth to gain momentum—the solid growth in the United Kingdom and some of the smaller regional economies is expected to broaden to include the larger economies, most importantly Germany. This outlook should be underpinned by a strengthening in domestic demand, supported by still accommodative monetary policy, and a lessening of the impact of fiscal consolidation in many countries. The existence of significant spare capacity across Continental Western Europe suggests that inflationary pressures are likely to remain subdued. In the UK interest rate rises and the appreciation of the exchange rate will work to mitigate against any significant pick-up in inflationary pressures.

Domestic economic conditions

Economic activity

As evident in Chart 1, a step up in growth occurred in the first half of 1997. This followed a temporary slowing in the economy over the last three quarters of 1996. The pick-up is even more apparent in terms of non-farm activity. The composition of growth in the June quarter was affected significantly by a small number of large one-off transactions, including the sale of gold by the Reserve Bank of Australia (RBA) and the sale of the Loy Yang B power station by the Victorian Government to the private sector. These transactions involved a transfer between components of the expenditure measure of GDP and as such did not have any net impact on aggregate GDP. Abstracting from these transactions, GDP growth in the June quarter 1997 was driven by solid growth in private consumption, dwelling investment and a substantial contribution to growth from non-farm stocks.

Chart 1: Contributions to GDP(A) growth (seasonally adjusted, adjusted for one-off transactions)



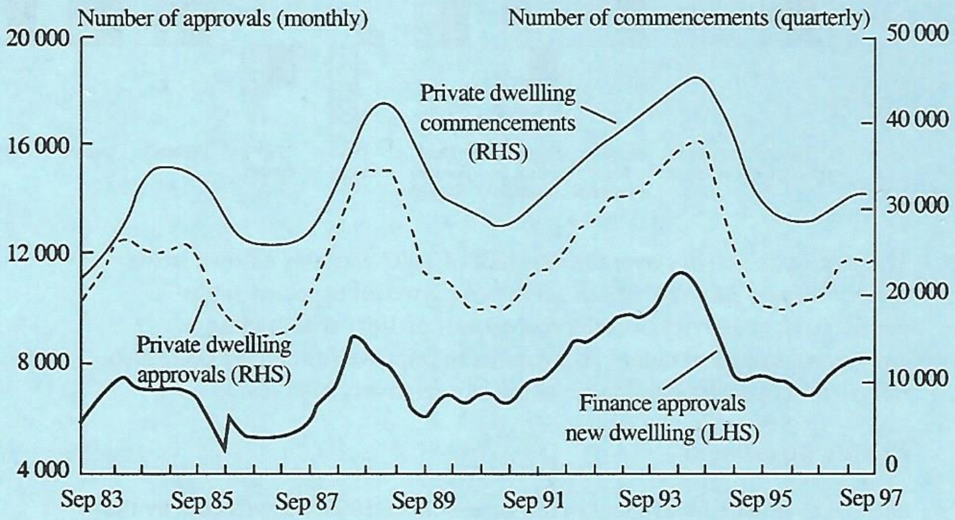
The step up in activity over the first half of 1997 was also evident in the major *business surveys*. These surveys reported an expected slight acceleration in activity over the second half of 1997 with trading conditions, sales and output all expected to improve further, which is also reflected in business confidence being at a relatively high level.

Private investment

Growth in private investment in the June quarter 1997 was affected by the purchase of the Loy Yang B power station. New private investment, which abstracts from the effect of this purchase, was flat in the quarter. While there were downward revisions to non-dwelling building investment expectations for 1997–98 in the most recent Australian Bureau of Statistics (ABS) Private New Capital Expenditure (CAPEX) survey, these results are at odds with other indicators for investment in the sector. In particular, the value of work yet to be done for non-residential buildings and engineering construction is very high and the value of non-residential building approvals is also high. Recent business surveys also reported an expectation of solid growth in capital expenditure over the next twelve months. In contrast, *equipment investment* intentions were revised up significantly in the CAPEX survey and are consistent with the forecast of moderate growth in constant price investment in 1997–98. Other indicators which also suggest strong growth in equipment investment include: commercial finance commitments and leasing finance for equipment related activities remaining at very high levels in recent months; weak growth in equipment prices; and business credit growth continuing its upward trend. In addition, the positive environment that existed at the time of 1997–98 Budget that was supportive of a continuation in strong growth in business investment remains in place—interest rates are at very low levels, there is a continued absence of price pressures and capacity utilisation and the corporate profit share are at high levels.

The recovery in the dwelling sector has become more apparent since the Budget, with an additional two quarters of solid growth in *dwelling investment*. Dwelling commencements have also continued to trend upwards through 1997 (see Chart 2). While there was some weakness in the sector in the middle of 1997, this appears to have been temporary with more recent building approvals and housing finance data suggesting that the underlying conditions are firm. There remains, nevertheless, monthly volatility in the data. The favourable fundamental influences on the sector remain: the oversupply of housing created in the previous upturn is being eroded rapidly; vacancy rates in some areas are low; and housing affordability is expected to remain very high with low mortgage interest rates (which are at their lowest levels since 1973), rising household income and low house price inflation.

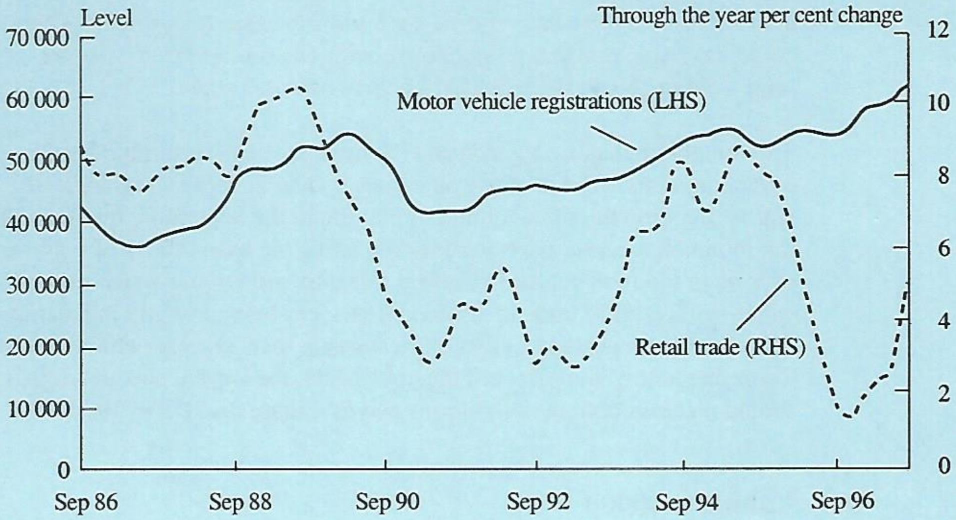
Chart 2: Trend housing indicators



Private consumption

Consumer spending continues to grow strongly with the recovery in retail spending and strong growth in motor vehicle registrations evident in Chart 3. This is consistent with recent improvements in measures of consumer confidence with the Westpac-Melbourne Institute consumer sentiment index showing rises in each of the past four months. There has also been a pick-up in optimism regarding the future of the labour market with the unemployment expectations index well above the long-term historical average. The strength of the recovery in the labour market will impact on household decisions to continue to spend, both directly in terms of increasing household incomes and indirectly through improved consumer confidence. Businesses are also expecting trading conditions to improve, with the September quarter Australian Business Expectations survey recording a strong rise in expected growth in sales across all industries.

Chart 3: Partial indicators of consumption (trend data)



Changes in stocks

There was a large fall in public authority stocks in the June quarter 1997, however this was due to the sale of gold by the RBA and the export of an ANZAC frigate, both of which were fully offset by a corresponding increase in exports. While there was a solid increase in private non-farm stocks, this only slightly exceeded sales growth (adjusted for the impact of the one-off transactions) and, as a result, the stocks-sales ratio was close to the historically low level recorded in the March quarter. The low level of the private non-farm stock-sales ratio suggests that firms are well placed to continue to increase production to match ongoing sales growth. Recent business surveys also indicate an anticipated build-up in private non-farm stocks in line with an outlook for strong sales growth, with the September quarter Australian Business Expectations survey indicating the largest expected increase in stocks over the coming year since that recorded in the June quarter 1994 survey.

Public final demand

Growth in public final demand was flat in the June quarter 1997, after abstracting from the sale of the Loy Yang B power station. Public final demand should pick up substantially in 1997–98, partly reflecting the base effects of the Loy Yang B sale in 1996-97 and information in the State Budgets released since May indicating strong growth from the State sector.

Imports and exports of goods and services

Reflecting continuing strength in underlying demand and some increase in prices, the value of *imports* rose solidly in the September quarter. Implied volume outcomes to date appear consistent with budget expectations. *Exports*, excluding the effect of the sale of gold by the RBA and an

ANZAC frigate, in the September quarter look to have shown continued modest growth in volume terms, complemented by a rise in prices partly associated with exchange rate movements in the quarter.

In terms of the outlook for rural exports, the widespread rain over much of the grain belt during the month of September helped to alleviate concerns that the lower-than-average rainfall recorded in previous months would continue and cause wheat yields in 1997 to be severely limited. Yields of the harvestable area of wheat in most southern and eastern regions are now expected to be at least around average levels. The Bureau of Meteorology is still forecasting an El Nino event to March 1998 and this is often associated with drier than normal conditions in eastern Australia. This could have some impact on planting conditions for next year's winter crop—although this is particularly uncertain at this stage.

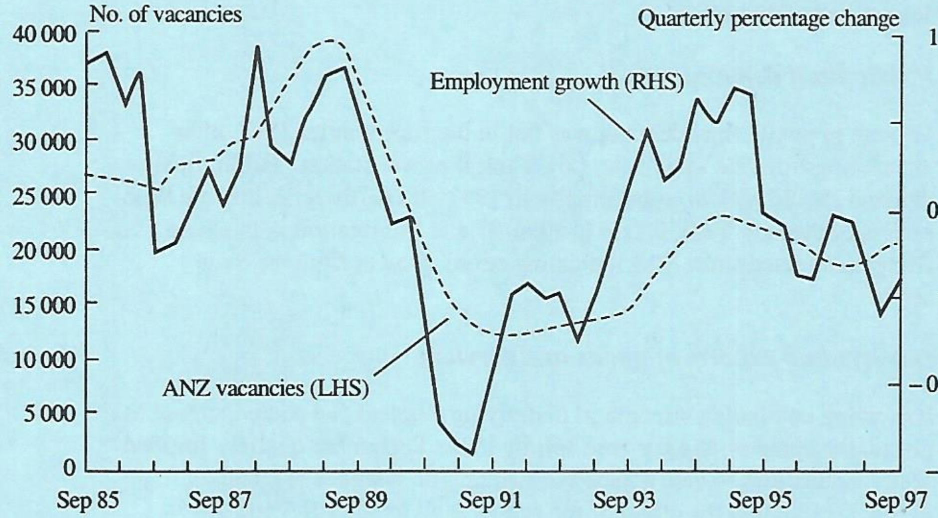
The monthly balance on goods and services has been in surplus for the past six months. The monthly outcomes to date in value terms indicate that strong growth in the volume of imports in the September quarter and a fall in merchandise exports (mainly reflecting the base effects of gold exports in the June quarter) has been offset by growth in service exports which will result in trade in goods and services being roughly in balance. With imports expected to grow more strongly than exports (which will be lower due to the base effect of the gold sales), the current account deficit should increase both in dollar terms and as a share of GDP in 1997–98.

Labour market

Employment has grown solidly on average in 1997–98 to date. While monthly employment outcomes have been volatile recently, employment growth has averaged around 14 400 per month over the last four months.

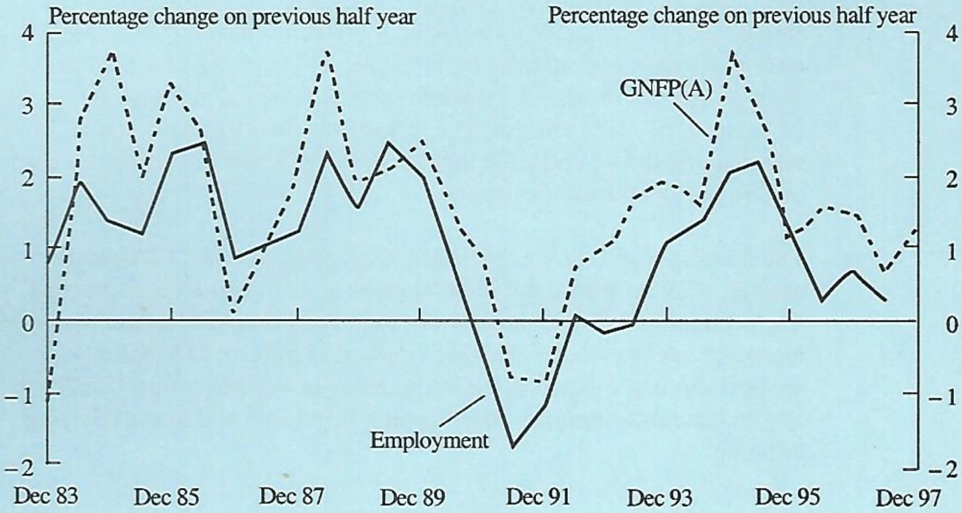
These outcomes appear consistent with the major job vacancy series, which have suggested solid employment growth in recent months. Both the ANZ Bank job advertisements series and DEETYA skilled vacancies index are at high levels. Despite falling slightly in the September quarter, the ABS vacancy series—which is the broadest measure of vacancies—remains at above average levels.

Chart 4: Trend job vacancies and employment growth



Supporting the outlook for strengthening employment growth is the step up in output growth in the first half of 1997 and the expectation that this momentum will continue through 1997–98[1]. Since most of the impact on employment from changes in activity occur in the three quarters following the change in activity, it would appear that short-term employment prospects remain positive.

Chart 5: Lagged output growth and employment growth



Note: GNFP(A) growth is brought forward six months, ie June 1997 half year growth appears as December 1997 half year growth, to illustrate the lag between growth in GNFP and employment.

Major business surveys are indicating some improvement in employment in the near term. The latest ACCI Westpac survey reported that firms are expecting a strengthening in employment in the December quarter, with expectations at their highest level since June 1995. The National Australia Bank survey also reported a firming in employment expectations for the December quarter. Expectations are now slightly above the levels recorded for the previous two years.

While vacancy data and expectations surveys point to a continuation of solid employment growth over the coming months, overtime and average hours worked—generally considered leading indicators of changes in labour demand—have not showed any discernible pick-up. However, given the expansion of enterprise bargaining leading to employers cashing-out overtime payments and the ongoing volatility of the hours worked series, these series appear to be less reliable indicators of underlying labour market pressures.

The *unemployment* rate is expected to continue to fall over the near term, after falling in September and October. However, the impact on the unemployment rate of faster employment growth is likely to be partly offset by an increase in the participation rate as more people are encouraged to look for a job.

Wages and prices

The forecast in the 1997–98 Budget was for some further moderation in wage pressures, with growth in average earnings on a national accounts basis being 4 per cent in 1997–98. Consistent with this outlook, the June quarter 1997 and preliminary September quarter 1997 data for average weekly ordinary time earnings for full-time adults show average quarterly growth of around 1 per cent. There is the prospect, however, that nominal wage growth may moderate further in line with low inflation and inflation expectations.

Inflationary pressures have continued to remain subdued, with an *underlying inflation* outcome in the September quarter of 1.5 per cent in through the year terms—the lowest outcome recorded since the series began in 1972. This low outcome reflects the favourable movement in nominal unit labour costs, the lagged impact of lower import prices, and ongoing competitive pressures.

The *headline Consumer Price Index (CPI)* fell again in the September quarter, with the annual inflation rate now at its lowest level since 1962. The declines in the headline CPI since the Budget largely reflect the fall in mortgage interest related charges, a decline in the cost of hospital and medical services (related to the introduction of the Government's Private Health Insurance Incentive Scheme on 1 July 1997) and low underlying inflation.

End notes

1 The Economic Overview to the Winter 1997 *Economic Roundup,* contains a detailed feature on the relationship between employment and output.

Source: *Economic Roundup*, The Commonwealth Treasury of Australia, Spring 1997, pp. 1–9.

Production and costs

Topic
7

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Reading 7.1

Introduction

Up to this point in the unit we have tended to emphasise the demand side of the market. In this topic we turn to the supply side and look at the analysis of the production and cost structures of a firm. Our overall objective is to develop a framework for analysing the operation of individual firms. This operational framework will enable you to understand issues such as efficiency, productivity and economies of size. This topic will also provide a central part of the background to the discussion of pricing strategies later in this unit. These issues are critical to the survival of commercial operations but they cannot be fully understood unless the underlying economic fundamentals are grasped.

We start by introducing the theoretical concept of a firm and discussing why firms exist. The nature of the production process is explored, and is linked to the cost structure of firms to provide an understanding of the costs relationships confronting firms. The concepts of economic profit, economic efficiency and productivity growth are introduced along the way.

Objectives

On the completion of this topic you should be able to:

- explain the nature of the firm;
- analyse a generalised production process;
- define the average product and marginal product of an input;
- explain the link between production and costs at the firm level;
- define and interpret short run and long run in the context of costs;
- define and interpret average costs and marginal costs;
- define fixed, variable and sunk costs; and,
- analyse the relationship between economic profit, economic efficiency and productivity growth and technological change.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 7 and 8.

Reading

Reading 7.1
H.C. Peterson & W.C. Lewis
'The nature of the firm'

The theory of the firm

In studying the theory and practice of firm-level decision making, it would be remiss of us not to at least touch on the issue of why we have firms. The theory of the firm is currently a rapidly expanding area of microeconomic theory. However, it is not addressed in many introductory texts. Begg et al. (2000) provide a very brief overview of the firm as an introduction to their Chapter 7. Reading 7.1 from Petersen and Lewis (1994) provides a concise overview of the basic theory on why firms develop the way they do in market economies, drawing on the work of Nobel prize winning economist Ronald Coase.

☐ *At this point, read Chapter 7 in Begg et al. (2000), pp. 90–104.*

Petersen and Lewis (1994) argue that firms exist and develop in a market because they perform some functions at a lower cost than is possible from other economic units. The main reason costs maybe lower is because many functions are carried out more efficiently 'in-house' rather than through contracting out. Clearly, the advantages of working 'in-house' as opposed to contracting out change overtime with new technology and changes in government regulations and consumer demands. This helps explains the dynamic nature of the firm.

Firms are diverse in terms of their size, function and legal structure. They are also orientated at achieving a very wide range of objectives of which profit maximisation is only one, and not always the most important one. This is of concern to a number of students because most of our analysis in this unit is couched in terms of profit maximisation. As long as profit maximisation is an objective our basic micro frameworks work well.

No one doubts for one minute that different firms respond in different ways to an increase in output price. Firms will expand output at different rates because of the differences between the firms in terms of resources and objectives. Some firms are run by managers that approximate pure profit maximisers, while others are run by people who seek other forms of satisfaction such as market share, status and an easy life. As long as they are maximising profits subject to these other criteria, we can expect our models to work well in indicating the general nature of the response to a price change.

☐ *You should now read Reading 7.1.*

When you have finished Reading 7.1 consider the following question.

Question 7.1

(a) What explanation do the authors put forward for the existence of firms?

(b) What factors constrain the size of a firm? Think of your own organisation. What might constrain the size of this organisation?

(c) Why is profit maximisation a useful assumption in explaining and predicting managerial behaviour? What factors complicate matters in this regard?

Economic profit

We have talked about profit in the context of profit maximisation. A layman's intuitive understanding of profit is that profit is simply the excess of revenues over costs. However, such a concept is more an accounting one than an economic one. Profit in an economic sense takes into consideration the returns owners may have earned if resources (e.g. their labour and capital) had been utilised elsewhere, i.e. it takes into consideration *opportunity cost.*

Economic profit can be defined as the difference between the returns from an enterprise in a period and the opportunity cost of the resources used up in the enterprise in the same period.

☐ *Reread sections 7-3 and 7-4 in Begg et al. (2000), pp. 97–9. When reading the section on profits you should pay particular attention to the definition of economic profits and the profit maximising principle of setting marginal revenue equal to marginal cost.*

Question 7.2

(a) What is the difference between opportunity costs and accounting costs and why do economists favour opportunity cost as the 'real' measure of cost?

(b) Explain the relationship between marginal cost and marginal revenue in deciding the profit maximising level of output.

(c) Explain the shapes of the marginal cost and marginal revenue curves in Figure 7.8 of Begg et al. (2000).

Having read Begg et al. (2000), you will be aware that there may be a substantial difference between economic profit and accounting measures such as net cash operating surplus, taxable income or other accounting measures of performance. However, it is important to note that the fact that these accounting measures are different to economic profit does not mean that one measure is correct and the others are wrong. Each indicator of performance measures a different aspect of the enterprise's operations. *Economic profit* measures the absolute value of the return available to the owners of the enterprise after the opportunity cost of all resources has been deducted from returns.

In most accounting measures it is common practise to not place a value on the resources provided by the owner of the business. This surplus, calculated by deducting the value of purchased inputs from returns, gives a measure of the absolute return to the inputs supplied by the owner: their labour, capital and management. If one deducts the value of the owner's labour and management input, we have the absolute value of the return to the owner's capital investment. When the opportunity cost on the owner's capital is less than the absolute value of the return on owner's capital, an economic or pure profit has been achieved.

In most large organisations, the owners of the firm are shareholders and they are either paid for any labour or management input they provide as wages and salaries (as would be the case with employee share participation) or, more likely, they are purely investors in the share market and they provide no input other than the issue price of their shares. In this case there is no opportunity cost on owner's labour and management to deduct.

The absolute value of the return to owner's capital can be divided by value of the owner's investment in the firm to give the rate of return to owner's capital, a widely used accounting concept. Owners are then expected to compare the rate of return with returns on alternative forms of investment to make a judgement about the profitability of the enterprise. Note that they are comparing the return on the capital with the opportunity cost of their capital. This is effectively the same thing as calculating economic profit except the accountant does not provide a measure of the opportunity cost on owner's capital. That is left to the owner's judgement.

Question 7.3

Suppose that you own a major shareholding in a large company involved in a broad range of retail activities, but do not become directly involved in the running of the company as your activities as a professional economist with a major merchant bank keep you fully occupied. Your hope is that the firm will maximise profits, although you know that this is a tough and competitive market.

(a) Are the managers of the company likely to share your enthusiasm for profit maximisation?

(b) Is it possible for you to impose profit maximisation, and to monitor the actions of the managers?

(c) Would the threat of a hostile takeover be a help or hindrance in encouraging the managers to pursue profit maximisation?

(d) How might the threat of a hostile takeover affect the long term position of the firm?

(e) What steps might you take to safeguard your interests?

Question 7.4

Suppose that you are a sole trader operating in the textile industry. During the past year, revenue received was $55,000 and you incurred direct costs of $27,000. You had $25,000 of your own capital tied up in the business during the whole of the year. Had you chosen to work for another company you could have earned $21,000.

Calculate the following items :

(a) accounting profit

(b) economic profit

(Assume that the interest rate during the year was steady at 10% pa.)

The production process

Changes in the total costs of production are the result of changes in the prices of inputs and/or changes in the levels of inputs used in the production process. Therefore, to understand why costs behave the way they do we need to consider the production process.

Firms use inputs to produce outputs. These inputs are called *factors of production* and can include land, raw materials, labour, capital equipment, fuel etc. Within these categories one can have subgroups like skilled and unskilled workers, and entrepreneurial effort. It is convenient to describe the relationship between inputs and outputs by a production function. This function indicates the output (Q) that a firm produces for every specified combination of inputs. For our purposes we often assume two inputs: capital (K) and labour (L).

$$Q = f(K,L)$$

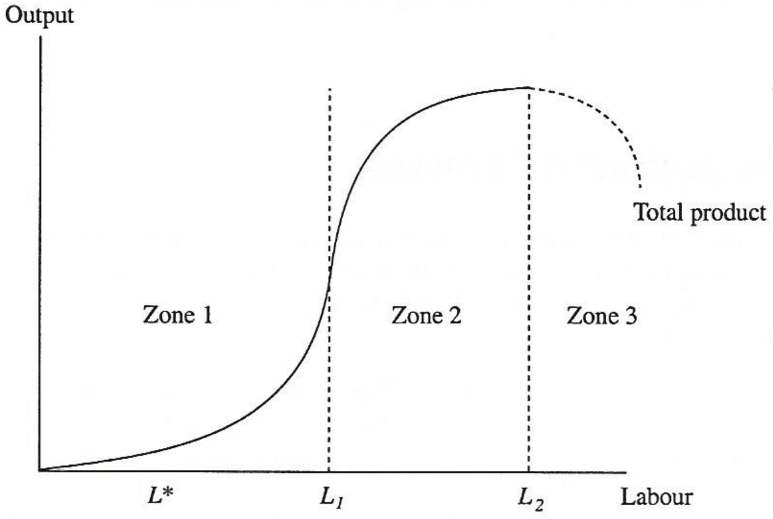
This equation states that output (Q) depends on the quantities of capital and labour used in the production process. The way the factors are combined to produce output is called the state of technology, and it is represented by the term f.

Of course in reality there are a lot more inputs than just labour and capital. We look at this simple two input world because it helps us to understand the basic principles of production. Importantly, these principles apply just as readily to advertising, fuel and sales promotion as they do to labour and capital. In developing these principles we start by looking at the one input case where we assume we are varying one input while holding the others constant. We then generalise the case to look briefly at the case where all inputs can be varied.

Production with one variable input

Consider the case in which capital is fixed but labour is variable so that the firm can produce more output by increasing its labour input. The diagramatic representation of the relationship between the level of the variable input and the level of output is called the total product curve and it is illustrated in Figure 7.1.

Figure 7.1: The total product curve



The general shape of this curve is determined by the nature of the underlying relationship between the variable input and output, and will vary depending on the industries and inputs examined. This relationship may be a reflection of a biological link (in the case of fertiliser and crop yields), an engineering relationship (in the case of labour and factory output as portrayed in our Figure 7.1) or a marketing relationship (in the case of advertising levels and sales).

In Figure 7.1 you will note that the total product curve has been divided into three zones based on the nature of returns to the variable factor.

- Zone 1 (covering the labour use up to L_1) is called the *zone of increasing returns* to the variable factor. Each additional unit of labour that is used:
  - adds to the level of output; and,
  - adds more to output than the previous unit of labour.
- Zone 2 (covering labour inputs between L_1 and L_2) is called the *zone of diminishing returns* to the variable factor. In this zone an additional unit of labour:
  - adds to the level of output; and,
  - adds less to output than the previous unit of labour.
- The last zone (beyond L_2)—Zone 3—is called the *zone of negative returns* to the variable factor. Any increase in the use of labour results in less output, not more.

All firms will try to set their input levels so they operate in Zone 2. Production in zones 1 and 3 would not be economically rational. Firms would not choose to produce in Zone 1 (with greater than zero labour but less the L_2 labour), as for any point in that range that is profitable, say L^*, there will always be another point corresponding to a higher level of labour that is even more profitable. If L^* is profitable, L^* plus one unit will be even more profitable because the next unit of labour will produce more output than the L^* the unit. In other words if a firm is operating in Zone 1 it is using too little labour.

Zone 3 is also clearly not optimal because each unit of additional labour used in this zone reduces rather than increases the level of output. No one would voluntarily choose to hire a worker if they knew that worker would reduce rather than increase the firm's output.

The optimal level of labour will always reside in Zone 2. The identification of where it will be in Zone 2 requires more information than is contained in Figure 7.1. In addition to the information summarised in Figure 7.1, we would need to know the value of each unit of output and the cost of each additional worker.

Those of you who work in manufacturing and marketing positions will have no difficulty relating the stylised total product curve above to your own management decisions. You need a certain level of advertising before it has any real impact but no firm seriously believes that all units of advertising will have the same impact. Similarly, people involve in hiring production staff will be aware of the need to focus on just what those extra members of the team will do for the team's production levels.

In reality not all total product curves will exhibit all three zones of production. Zone 2 will exit but zones 1 and 3 may not be present. It depends on the industry and technology involved.

It would be wrong to imply that firms always operate in Zone 2. They will all attempt to do so (even though they may never have heard of 'Zone 2') but many are unsuccessful. They may fail to do so because conditions change which shift a given level of the variable input from Zone 2 into another zone. In the case of advertising this could be caused by the competitive actions of another firm changing the effectiveness of your firm's advertising outlays. An agricultural example could be the overstocking of a property in times of drought.

The act of operating outside the zone could also be caused by miscalculations by management. The information that is required to specify the zones is generally not known with precision. Moreover, it is often not worth spending large amounts of time and money to accurately assess each purchase or hiring decision. However, once our decision is shown to be sub-optimal we respond by changing input decisions, or at least we take that information into account when we next confront a similar case.

In this simple world of one variable input and one output we can define two useful concepts: *average product and marginal product.*

- The level of output per unit of labour is called the *average product of labour.*

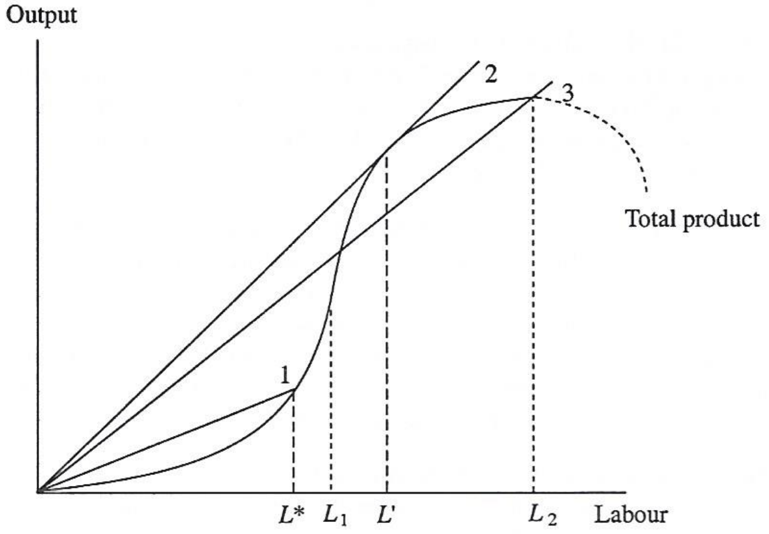
  Average product of labour (APL) = Q/L

- The change in output from the use of an additional unit of labour is called the *marginal product of labour.*

  Marginal product of labour (MPL) = $\Delta Q/\Delta L$

We can illustrate these two concepts using the total product curve in Figure 7.2.

Figure 7.2: **The total product curve, marginal product and average product**

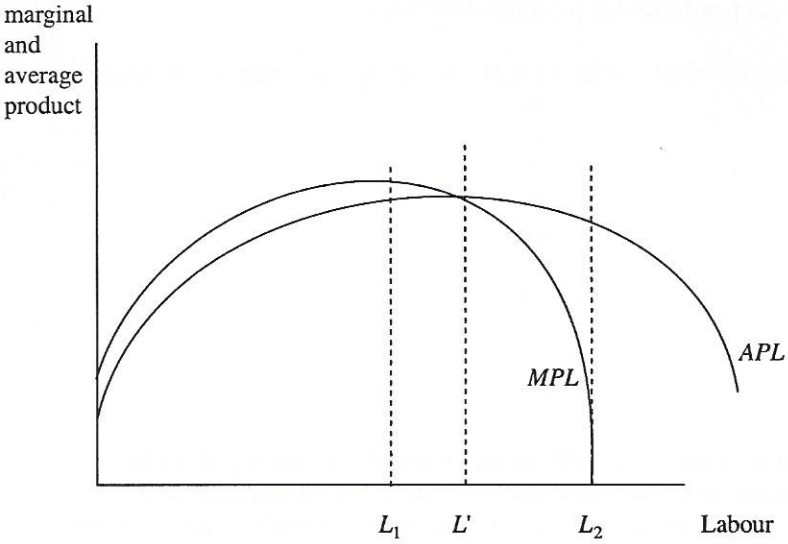


- The slope of a straight line or ray, drawn from the *origin* to any point on the total product curve, gives the value of the average product of labour at that level of output. For example, the average product of labour when L^* units of labour are used is given by the slope of the ray marked 1. In the production system summarised by Figure 2, the average product of labour is maximised when L' units of labour are used and the value of that average product is given by the slope of the ray marked 2. As you expand the use of labour up to L', the average product of labour rises. If you expand the use of labour beyond L', the average product of labour will fall (see Ray 3 for example). Note that the level of labour that maximises the average product of labour lies inside Zone 2 on the total product curve.

- The marginal product of labour is equal to the slope of the total product curve itself at any given level of labour usage. From Figure 7.2 you can see that the slope of the total product curve increases up to the point where L_1 units of labour are used are declines thereafter. Beyond L_2 units of labour the slope of the total product curve is declining and negative.

Now consider Figure 7.3 where the *MPL* and *APL* curves correspond to our total product curve from figures 7.1 and 7.2.

Figure 7.3: Average and marginal products



Note that the marginal product curve peaks when labour is equal to L_1 and cuts the average product curve at L' when the average product of labour is at its maximum. The only point where the average product is equal to the marginal product is when the average product is at its maximum. Finally, the marginal product of labour is equal to zero at L_2 when total product output is at its maximum value.

If we now go back to Figure 7.1 and the three stages of production, we can see the critical characteristics of each zone.

Zone 1

- Increasing marginal and average products of labour.
- The marginal and average products of labour are both positive.

Zone 2

- Decreasing marginal product of labour.
- Average product of labour initially increases and then falls.
- The marginal and average products of labour are both positive.

Zone 3

- Decreasing average and marginal products of labour.
- The marginal product of labour is negative and the average product is positive.

Question 7.5

Complete the following table and graph the values of the marginal product and average product of fertiliser

Fertiliser used	*Wheat produced*	*Marginal product*	*Average product*
1	*15*		
2	*31*		
3	*48*		
4	*59*		
5	*68*		
6	*72*		
7	*73*		
8	*72*		
9	*70*		
10	*67*		

You should now identify an input/output relationship that you are familiar with from your own workplace. See if you can identify the general shape of the response curve involved and explain the factors driving the shape. Where is your firm operating on this curve?

Production with more than one variable input

In most cases firms will have more than one variable input to deal with and in many cases the number of inputs could be large. In these multiple input cases the relationships outlined above still hold with a couple of important modifications:

- the average and marginal products of an input will not only change with changes in the level of the input but also with changes in the levels of other inputs; and,

- the optimal level of use of an input will be determined by changes in the marginal product and/or price of that input and also changes in the marginal products and/or prices of other inputs.

Why so? Well, factors of production are generally inter-related in that changes in the levels of use or marginal products of one factor will often influence the marginal products of other factors. An obvious example is the link between labour and capital in a manufacturing environment. The introduction of more and better machines will tend to replace labour and improve the marginal product of the labour that is still employed. Similarly, if the price of labour increases relative to the price of capital, firms will tend to substitute capital for labour. This substitution will be moderated by the increase in the marginal product of labour as the use of labour falls and the use of capital rises. The increase in the use of capital will also tend to reduce the marginal product of capital which in turn will also moderate the rate of capital—labour substitution.

Inputs are said to be *complementary in production* if an increase in the marginal product of one increases the marginal product of the other. They are *substitutes in production* if an increase in the marginal product of one reduces the marginal product of the other. An example of complementary production inputs would be machinery and machinery operators, while excavation machinery and manual labourers are probably substitutes in production.

The link between production and costs

Now that we have considered the production process and the two important concepts of *average product of labour* and *marginal product of labour*, it's now opportune to study how costs behave the way they do in production.

Begg et al. (2000) provide a very useful foundation discussion to the link between production and costs, and so we will get you to study the relevant chapter first, before exploring some of the issues and concepts a little further in these notes.

☐ *Now read Chapter 8 in Begg et al. (2000), pp. 108–24, on costs and production systems. When reading this chapter concentrate on understanding the differences and relationships between:*

(a) average, marginal and total costs; and

(b) short run and long run costs.

You should also make sure that you can draw and interpret figures 8.9 and 8.10 on p. 121 and 123.

Question 7.6

The following questions are a guide to your study of this chapter.

(a) What is the difference between 'technical efficiency' and 'economic efficiency'? Is this distinction important?

(b) How is the 'long run' differentiated from the 'short run'?

(c) Explain the reasons behind the 'U' shape of the average cost curve, with reference to both economies and diseconomies of scale.

(d) What is the relationship between average cost and marginal cost at different points on the long run marginal cost curve? Can you explain why?

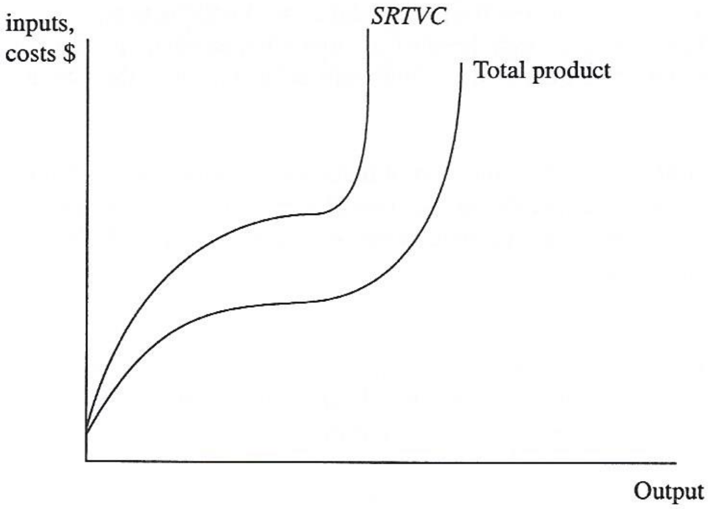
(e) Explain why the short run marginal cost curve is similar in shape to the long run marginal cost curve? (Are the reasons the same, or different?)

(f) What is the significance of the short run average variable cost to a firm's output decision?

(g) How may a firm reduce its costs in the long run, given a short run loss?

Knowledge of production relationships are important in part because production relationships and factor prices together determine the cost structure that firms confront. The proof of this link between production and costs is relatively simple. Start by assuming that factor prices are constant and we only have one variable input, say labour.

Figure 7.4: Derivation of cost curves from production curves



The total product curve in Figure 7.4 is identical to the curve in Figure 7.1 except that labour is now shown on the vertical axis and output on the horizontal axis. Now if we multiply each level of labour by the price of labour, we have the total cost of labour at each level of output. Given that we have assumed that labour is the only variable input, this curve shows us short run total variable costs as defined by Begg et al. (2000, pp. 119–20). This curve, labelled *SRTVC* in Figure 7.4, is the *short-run total variable cost curve.* It has same general shape as the total product curve because it is just a scaled version of it. That is, we have derived the *short-run total variable cost* curve by simply transposing the total product curve and multiplying by the price of labour (remember the price of labour is a constant).

The *short-run marginal cost curve* and the *short run average variable costs* curves can be derived from the *short-run total variable cost* curve using the same logic we used to derive the marginal and average product curves from the total product curve. The *short-run marginal cost* curve is a reflection of the slope of the short run total cost curve at any given level of output while the *short-run average variable cost* curve can be derived by examining the slope of a series of rays from the origin to the total cost curve.

If we add *average fixed costs* to *average variable costs* we have the *short-run average total cost* curve portrayed by Begg et al. (2000, Figure 8.8, p. 120). What we have shown is that the slopes of these cost curves can be completely explained by the price of the factors of production and the shape of the production function. This means that the nature of the production relationships determines the nature of the short-run cost curves that are the focus of so much microeconomic analysis.

If you now compare the *marginal and average cost curves* in Begg et al. (2000, Figure 8.5, p. 115) with the *marginal and average product curves* in Figure 7.3, you will see there is an obvious relationship. Once again, the marginal and average cost curves are simply scaled, transposed versions of the marginal and average product curves respectively.

Short-run and long-run costs

When reading Begg et al.'s (2000, pp. 110–15) discussion of the long-run costs, it is important to remember that the factors that determine the 'U' shape in the short-run average cost curve are completely different from those that determine the shape of the long run average cost curve. The shape of the short-run curve is determined by the nature of the total product curve while the shape of the long-run average cost curve is determined by the existence and extent of *economies and diseconomies of size.*

A firm with a 'U' shaped short run average cost curve need not confront a 'U' shaped long run average cost curve. In fact, most empirical work suggests that very few if any firms confront 'U' shaped long-run average cost curves. Most long-run average cost curves have been found to be either continuously downward sloping or, more frequently,' L' shaped. There is little empirical evidence to support the notion that diseconomies of size are important in any industries although anecdotal evidence of diseconomies abounds.

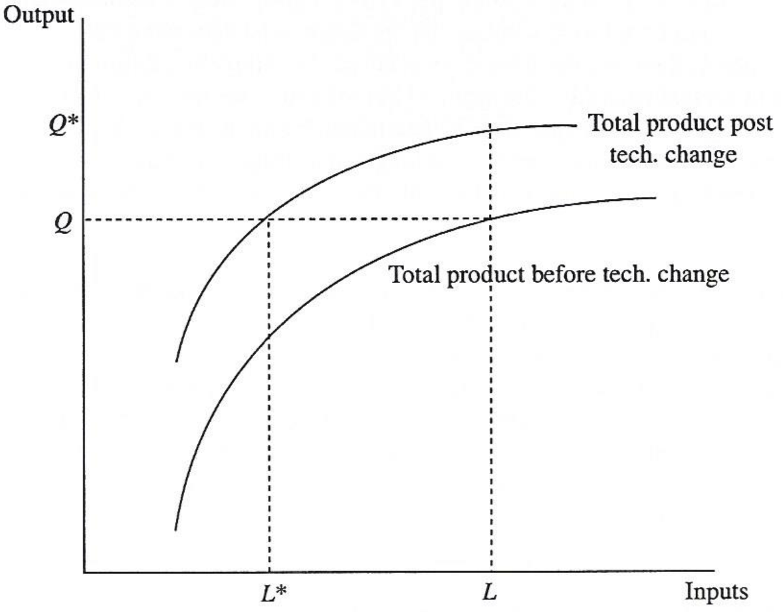
Question 7.7

Attempt problems 5 to 7 in Begg et al (2000), p. 125.

Technological change and productivity growth

Firms and governments throughout the world spend huge sums of money on research and development. These outlays are aimed at developing new products or technologies that will improve the profitability of businesses and economies as a whole. The introduction of these new technologies is known as *technological change* or *technological progress,* and is an important dynamic element in operation of firms and markets. Technological change is said to have occurred when there is a positive change in the relationship between inputs and outputs. It could be evidenced in a growth in the level of output with a commensurate growth in input levels or as a reduction in input usage without a commensurate reduction in output. Diagrammatically, it can be portrayed as an upward shift in the total product curve (see Figure 7.5).

Figure 7.5: The impact of technological change



The firm modelled in Figure 7.5 was producing Q units of output using L level of inputs. With the advent of new technology, the firm can now produce Q with only L^* inputs or produce Q^* output with L units of inputs. The decision to expand output and/or contract input levels will be based on which option is the most financially attractive.

Given the link we have established between costs and production, it will be apparent that in shifting the total product curve *upwards*, technological change will tend to shift the cost curves confronting the adopting firm *down*. This is the source of profits from technological change and the incentive that firms have to seek out new and improved technology.

Technological change that results in a general improvement in the marginal product of all inputs is called *neutral technological change.* If the technological change improves the efficiency of one input more than another, it is called *biased technological change* (e.g. labour saving or labour using). An example of neutral technological change could be improvements in managerial training while labour saving technological change is commonly seen in the form of new machines displacing workers on the shop floor.

Technological change can be introduced into the production system via new capital equipment (called *capital embodied change*) or through improved managerial practices or labour skills (called *managerial* or *labour embodied change* respectively).

The impact of technological change will show up in improvements in the profitability of firms and changes in the prices of outputs due to shifts in industry supply curves. The aggregate impact of technological change is also measured through the rate of *productivity growth.* Begg et al. (2000, p. 118) make the point that productivity in 'everyday terms' refers to the average product of labour. Growth in the level of output per unit of labour is widely referred to as *labour productivity.* However, labour productivity is, at best, a partial measure of the underlying rate of productivity of inputs in an industry.

Increases in labour productivity are consistent with a wide range of changes in an industry such as:

- increases in the efficiency of capital;
- increases in the price of labour;
- reductions in the price of capital; and
- reductions in the efficiency of labour.

Paradoxically, increases in labour productivity are not likely to be associated with increases in the relative efficiency of labour compared with other inputs.

On face value, the linkage of some of these changes to increases in labour productivity seems rather puzzling. Let's take each in turn.

Any changes that improve the relative efficiency of capital equipment will tend to do two things in a production system—first, the level of output will tend to increase, and second, there will tend to be an increase in the level of capital employed relative to labour. This last change would tend to increase the rate of growth in labour productivity (even though the work carried out by workers may not have changed) and under some circumstances, decrease capital productivity (e.g. if the substitution of capital for labour results in the capital input increasing at a faster rate than output).

Now consider the case when labour prices rise more rapidly than capital prices—firms would tend to contract output and substitute capital for labour. With high rates of substitution of capital for labour, the level of labour used may fall at a higher rate than the reduction in the level of output. This will result in an increase in the output to labour ratio, or labour productivity. This argument holds for both increases in the price of labour directly, and relative increases in labour costs as a result of reductions in the price of capital. The same scenario could be expected to follow a fall in the efficiency of labour.

Labour productivity and *capital productivity* (output per unit of capital) are notoriously difficult to interpret. Most productivity studies carried out by economists today are based on measures of *total factor or multi-factor productivity*. These indicators measure changes in the ratio of output to total inputs (or an aggregation of the key inputs in the case of multi-factor productivity). The measure becomes:

$$TFP = Q / (L + K).$$

While this approach is more conceptually sound than the partial measures it is also more difficult to derive. The procedures for computing *total factor productivity* are beyond the scope of this subject. If you have an interest in this area you can obtain more information from your tutors.

Now consider your organisation. What significant examples of technological change can you identify? What impact have they had on the use of factors of production and costs? Is the technological change neutral or biased?

Summary

This topic provided you with the basis of a fundamental framework for understanding firm-level operations. In studying the material in this topic you should have developed a good idea of what economists mean by a profit maximising level of output, how it can be derived and how it is influenced by the cost structure of an enterprise. You should also understand the important role technological change plays in reducing firm level costs and changing the mix of factors of production used in the production system. You can analyse the extent and sources of economies of size in an industry and hopefully you will also know enough to be able to intelligently interpret the various measures of productivity that are placed before managers.

In the next two topics we take our simple model of firm-level decision making and use it to analyse how managers are likely to behave under a range of competitive market decisions. Topic 8 deals with the extreme cases of perfect competition and perfect monopoly, while Topic 9 deals with situations where strategic interactions between firms are important.

Review questions

Review question 7.1

Why do firms exist?

Review question 7.2

What is the relationship between economic profit and opportunity cost?

Review question 7.3

In a one-variable input production process, describe how output varies with input. What is the significance to managers of this phenomenon? In your answer refer to both the average product of labour and the marginal product of labour.

Review question 7.4

(a) Explain the relationship between marginal cost and average cost at different points on a cost curve.

(b) What determines the shape of:

(i) the short run average cost curve; and

(ii) the long run average cost curve?

Review question 7.5

What are the links between technological change, productivity, costs and profits?

Review question 7.6

According to data provided by Boeing to a US Senate committee in 1975, the cost (in cents) per passenger mile of operating a Boeing 747 on a

flight of 1,200 and 2,500 miles with 250, 300 and 350 passengers aboard was as follows:

Passengers	***Distance 1,200***	***Distance 2,500***
	(cents per passenger mile)	
250	***4.3***	***3.4***
300	***3.8***	***3.0***
350	***3.5***	***2.7***

(a) If the number of passengers is between 250 and 300, what is the marginal cost of carrying an extra passenger on a 1,200 mile flight?

(b) If the number of passengers is 300 and if the flight is between 1,200 and 2,500 miles, what is the marginal cost of flying an additional mile?

(c) In 1975, the economy fare for a 2,500 mile flight was $156.60. if a Boeing 747 carried 300 passengers on such a flight, would it cover its operating costs?

Source: Mansfield (1994), p. 247.

Review question 7.7

Is it possible for an industry to experience economies of scale and diminishing returns to labour simultaneously?

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Suggested answers

Topic 7

In-text questions

Question 7.1

Check back on Reading 7.1 if you have any doubts about this question.

Question 7.2

(a) According to Begg et al. (2000), 'opportunity cost is the amount lost by not using the resource (labour or capital etc) in its best alternative use' (p. 94).

Accounting costs tend to exclude the opportunity cost of the owners labour and capital.

(b) Marginal cost is the increase in total cost that arises from a small expansion in output. Marginal revenue is the in crease in revenue that arises from a small expansion in output. When $MR = MC$ profits are maximised. When $MR > MC$ too little is being produced. When $MR < MC$ too much is being produced. Note that when MR is not equal to MC profits may still be made but those profits are not as high as they would be if production was set so MR did equal MC.

(c) The MR curve in Figure 7-8 in Begg et al. (2000, p. 102) can be derived from a linear demand curve. The linear demand curve has exactly the same intercept term on the vertical axis as the MR curve but it has half the slope.

The MC can be derived from the TC curve which in turn is a reflection of the production function. The shape of the MC curve is the inverse of the Marginal Product curve.

Question 7.3

(a) One possibility is that the managers' aims will be to ensure job security and to safeguard a good salary. These objectives may not coincide with profit maximisation, especially if the managers' salaries are seen to be associated with sales or market share.

(b) The problem is that it may not be a straightforward matter for you to monitor the managers, or to assess whether sales volume and price have been set to maximise profits.

(c) The managers may be aware that a hostile takeover could well be followed by changes in management. This may provide an incentive for profit maximisation, which may reduce the likelihood of a takeover.

(d) The threat of a hostile takeover may lead to short-termism. It may be more difficult to undertake long-term investment if the firm becomes vulnerable to takeover.

(e) You need to find some way of setting appropriate incentives for managers, perhaps by seeing that they hold some shares in the company. If you are anxious about the long-term position of the company, you might wish to take measures to reduce the probability of a takeover or to limit its possible impact on the existing managers.

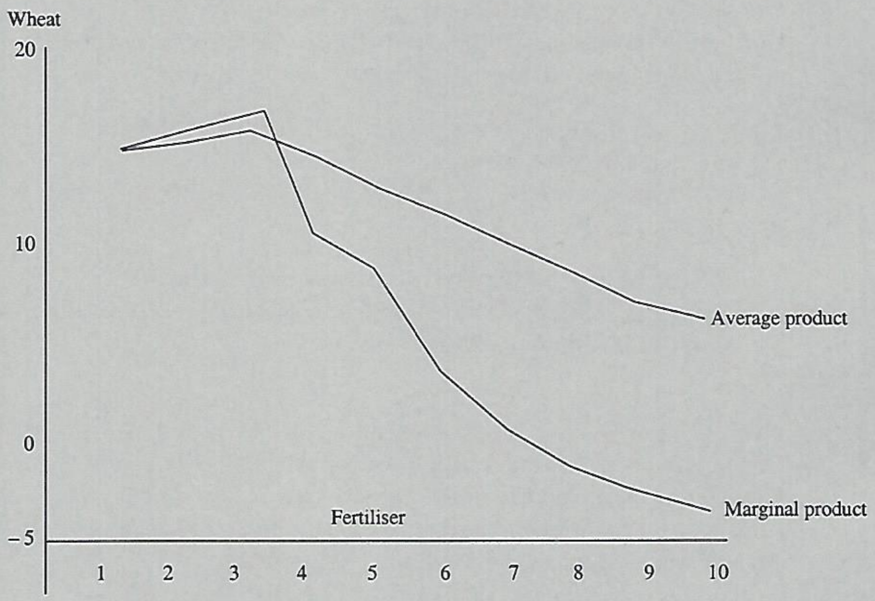
Question 7.4

(a) $28,000

(b) $4,500

Question 7.5

Fertiliser used	Wheat produced	Marginal product	Average product
1	15	15	15
2	31	16	15.5
3	48	17	16
4	59	11	14.8
5	68	9	13.6
6	72	4	12
7	73	1	10.4
8	72	−1	9
9	70	−2	7.8
10	67	−3	6.7



Question 7.7

5(a)

Q	*TC*	*MC*	*AC*
0	12		
1	27	27	27
2	40	13	20
3	51	11	17
4	60	11	15
5	70	10	14
6	80	10	13.33
7	91	11	13
8	104	13	13
9	120	16	13.33

(b) *MC* is less that *AC* when *AC* is declining, and above *AC* when *AC* is increasing.

(c) This is short run data because there are $FC = 12$ (i.e. $TC = 12$ when there is no output).

6(a) The short run refers to a period of time in which at least one factor of production is fixed. In the long run all inputs are variable and so there are no fixed costs.

(b)
- The *SAFC* curve falls continuously but at a decreasing rate; i.e. *TFC*/*Q*
- The *SAVC* curve falls and then rises.
- The *SATC* also falls and then rises. It is derived as a vertical summation of the *SAFC* curve and the *SAVC* curve.

(c) The shapes of the cost curves are a reflection of the shapes of the production curves because production relationships and cost relationships are driven by the same technological factors.

7(a) & (b) This is a question about when it is optimal for a firm to stay in production when it is making a loss. Firms may continue to produce even thought they are making a loss, as long as (1) they are more than covering their variable costs and (2) they believe things will improve in the long run. This improvement could come from improved market conditions or lower costs due to an increase in efficiency.

Review questions

Review question 7.1

Refer to the study notes under 'The theory of the firm' and Reading 7.1.

Review question 7.2

Refer to the study notes under 'Economic profit'.

Review question 7.3

Refer to the study notes under 'The production process'.

Review question 7.4

Refer to the study notes under 'The link between production and costs' and Begg et al. (2000).

Review question 7.5

Refer to the study notes under 'Technological change and productivity growth'.

Review question 7.6

(a) If 250 passengers were carried, total operating costs were

1,200 x 250 x 4.3 cents = $12,900

If 300 passengers were carried, total operating costs were

1,200 x 300 x 3.8 = $13,680

Since 50 extra passengers cost an extra $780 (or $13,680–$12,900), one extra passenger costs (approximately) $15.60 (or $780/50).

(b) For a 1,200 mile flight, total operating costs were

1,200 x 300 x 3.8 cents = $13,680

For a 2,500 mile flight, total operating costs were

2,500 x 300 x 3 cents = $22,500

Since 1,300 extra miles cost $8,820 (or $22500 – $13,680), one extra mile cost (approximately) and extra $6.78 (or $8,820/1,300).

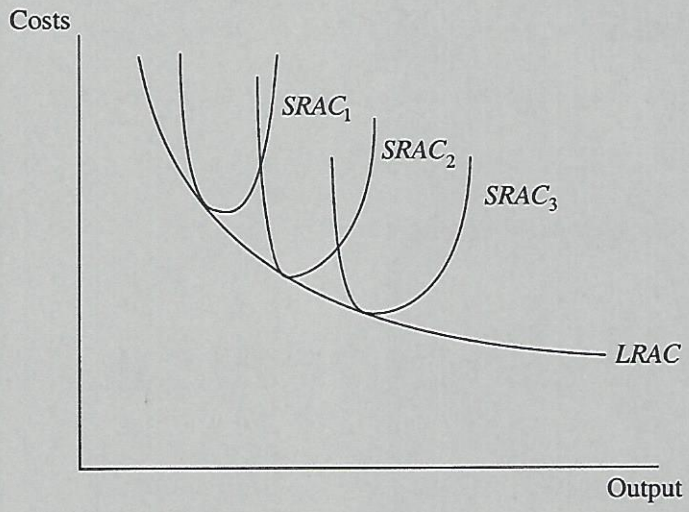
(c) Yes. The total operating cost per passenger equalled 2,500 x 3 cents or $75, which is less than $156.60.

Source: Mansfield (1994), pp. 247–8.

Review question 7.7

Yes, economies of scale (or size) is a long run concept as revealed by the shape of the *LRAC* curve, while diminishing returns is a short run concept evidence in the shape of the *SRAC* curve.

In the diagram below, the shape of the *LRAC* is consistent with economies of scale (or size) while the shape of the *SRAC*s is consistent with a total product curve exhibiting diminishing returns to the variable factor over some range of input use.



The nature of the firm

Reading 7.1

H. C. Petersen & W. C. Lewis

In order to earn profits, the firm organizes the factors of production to produce goods and services that will meet the demands of individual consumers and other firms. The concept of the firm plays a central role in the theory and practice of managerial economics. Thus a significant part of this text is focused on production, cost, and the organization of firms in the marketplace. These topics form the basis for what is known in economics as the theory of the firm. An understanding of the reason for the existence of firms, their specific role in the economy, and their objective provides a background for that theory.

The rationale for the firm[2]

In a free-market economy, the organization and interaction of producers (i.e., firms) and consumers is accomplished through the price system. There is no need for any central direction by government, nor is such central control or planning thought to be desirable. Within the firm, however, transactions and the organization of productive factors generally are accomplished by the central control of one or more managers. For example, workers subject themselves almost completely to management during the work period. Thus there is an apparent dichotomy in the organization of production in a market economy. The price system guides the decentralized interaction among consumers and firms, while central planning and control tend to guide the interaction within firms. This raises the question, Why is the production system not completely guided by price signals? That is, why do firms exist in a market economy?

Essentially, firms exist as organizations because the total cost of producing any rate of output is lower than if the firm did not exist. There are several reasons why these costs are lower. First, there is a cost of using the price system to organize production. The cost of obtaining information on prices and the cost of negotiating and concluding separate contracts for each step of the production process would be very burdensome. Firms often hire labour for long periods of time under agreements that specify only that a wage rate per hour or day will be paid for the workers doing what they are asked. That is, one general contract covers what usually will be a large number of transactions between the owners and workers. The two parties do not have to negotiate a new contract every time the worker is given a new assignment. The saving of the transactions costs associated with such negotiations is advantageous to both parties, and thus both labor and management voluntarily seek out such arrangements.

A secondary explanation for the existence of firms is that some government interference in the marketplace applies to transactions among firms rather than within firms. For example, sales taxes usually apply only to transactions between one firm and another. In some states, a construction company may have to pay sales tax on cabinets purchased from an independent cabinetmaker. By hiring that person, this tax is avoided and the cost of producing output is reduced. By internalizing some transactions within the firm that would otherwise be subject to those interferences, production costs are reduced. Because this is a secondary factor, firms would exist in the absence of such interference, but it probably contributes to there being more and larger firms.

Given that production costs are reduced by organizing production factors into firms, why won't this process continue until there is just one large firm, such as a giant General Motors or Exxon that produces all goods and services for the entire economy? There are at least two reasons. First, the cost of organizing transactions within the firm tends to rise as the firm gets larger. Logic dictates that the firm will internalize the lower-cost transactions first and then the higher-cost transactions. At some point, these internal transactions costs will equal the costs of transacting in the market. At that point, the firm will cease to grow. For example, all automobile producers in the world buy tires from companies that specialize in the production of rubber products. Surely, Ford and General Motors must have considered building plants to produce their own tires. It can be inferred that the cost of developing the new management skills required for such a different sort of production and the difficulty of managing an even larger and more complicated business must have been greater than the cost of continuing to buy tires from Goodyear, Michelin, and other producers.

Another example is legal services. Usually, attorneys are not an integral part of the production process but rather are needed periodically. It would be too costly for many firms to have full-time attorneys whose services would not be needed on a continual basis. So, rather than having a full-time lawyer employed by the firm, legal services are contracted on a when-needed basis. The cost of such an arrangement for most firms is lower. In contrast, large firms that have a continual need for legal services generally have an in-house legal staff.

A second factor constraining firm size is that an entrepreneur's organizational skill is limited. Resources within the company may not be efficiently allocated if the firm's size exceeds the manager's ability to control the operation. To overcome this problem, many large firms are organized into a group of divisions referred to as 'profit centers'. The management of each of these seeks to maximize that division's profit. By having a number of smaller organizations each being managed somewhat independently, the problem of limited ability to control the larger firm is at least partially overcome.

Both these reasons for a limit on the size of the firm fall under the heading of what economists have termed 'diminishing returns to management.' Stated another way, production costs per unit of output will tend to rise as firms grow larger because of limited managerial ability. It should be noted that many large firms recognize the problem of excessive size and decentralize by establishing a number of separate divisions or profit centers that act as individual firms.

The objective of the firm

This book approaches microeconomics from the perspective of efficient management of a business or other organization. To be able to discuss efficient or optimal decision making requires that a goal or objective be established. That is, a management decision can only be evaluated against the goal that the firm is attempting to achieve. Traditionally, economists have assumed the objective of the firm is to maximize profit. That is, it is assumed that managers consistently make decisions in order to maximize profit. But profit in which period? This year? The next five years? Often, managers are observed making decisions that reduce current year profits in an effort to increase profits in future years. Expenditures for research and development, new capital equipment, and major marketing programs are but a few examples of activities that reduce profits initially but will significantly increase profits in later years.[3]

As both current and future profits are important, it is assumed that the goal is to maximize the present or discounted value of all future profits.[4] Formally stated, the goal or objective function firm is to

$$\text{maximize: } PV(\pi) = \frac{\pi_1}{1+r} + \frac{\pi_2}{(1+r)^2} + \ldots + \frac{\pi_n}{(1+r)^n} \qquad (1\text{–}1)$$

where π_t is profit in time period t and r is an appropriate discount rate used to reduce future profits to their present value. Using the Greek letter Σ to indicate that each of the terms on the right-hand side of the equation have been added together, the objective function can be written as

$$\text{maximize: } PV(\pi) = \sum_{t=1}^{n} \frac{\pi_t}{(1+r)^t}$$

The present value of all future profits also can be interpreted as the value of the firm. That is, it is what a willing buyer would pay for the business. Thus, to maximize the discounted value of all future profits is equivalent to maximizing the value of the firm. The terms *profit maximization* and *value maximization* will be used interchangeably in the remainder of this book.

Maximizing versus satisficing

Considerable controversy has developed about the 'realism' of this assumed management goal. Advocates of alternative theories of the firm argue that the behaviour of real-world managers is not always consistent with the profit-maximization goal. Other objectives are seen as being at least as important as profit maximization. Among the alternatives that have been identified are maximizing total revenue; maximizing employment tenure and departmental budget; maximizing executive salaries; achieving 'satisfactory' profit levels; maximizing the manager's individual utility function; and maximizing market share subject to a satisfactory profit constraint. Indeed, an entire literature has developed on the subject of 'satisficing rather than 'maximizing' management objectives.[5]

Some critics of the profit-maximization assumption argue that it is unrealistic because managers must function in an environment characterized by inadequate information and uncertainty about the outcome of any strategy that might be adopted. Therefore, as a practical matter, it is really impossible to maximize profit. Economist Fritz Machlup responded to this criticism by comparing managing a firm to driving a car.[6] When deciding whether to pass another car on a two-lane highway, a driver must consider a variety of conditions. A few of these include the speed of his car, the car that is to be passed, and that of any oncoming vehicles; the road conditions; the existence of any curves or intersections that may be upcoming; and lighting conditions. Obviously, to analyze this situation completely prior to passing the car ahead might require the assistance of a computer and several working days.

Clearly, however, the typical driver makes an intuitive evaluation of these conditions in a matter of a few seconds or less and makes a decision. Machlup contends that managers are seeking to maximize profit and simply react intuitively to a set of conditions characterized by incomplete information and uncertainty in the same manner as the automobile driver. Thus, while there may be additional information that would result in even greater profit, managers are striving to generate the greatest possible profit given the limited information available.

Although some managers may have other goals, most of the criticism leveled at the profit-maximization assumption may be irrelevant. Economics is less interested in how some managers really act than in understanding the economic environment in which managers must function and, more importantly, in developing a framework for predicting managerial responses to important changes in that environment.

In this context, Machlup argues that it is fruitless to worry about how real-world business managers really behave and what their goals really are. The real question is: If we assume that firms attempt to maximize profit, will the principles of economics derived from that objective function explain the behaviour of real-world firms? If the answer is yes, it really does not matter if the assumed goal is not entirely realistic. For example, suppose that there are two firms, *A* and *B*, that are identical except in one respect. The manager of *A* works 16 hours a day seven days a week, whereas the manager of *B* works only four days each week and leaves the office shortly after lunch each day to play golf. Because of manager *A*'s commitment to work, it is probable that profits for firm *A* are greater than at firm *B*, but this difference in commitment to work and its effect on profit is not the issue. The fundamental question is: Will the two managers respond the same way to changes in economic conditions? If the price of their product increases, do both use the profit-maximizing strategy of increasing the rate of output? The manager of *A* may take action first because he is on the job most of the time, but the response should be the same for both firms.

Most economists agree that the principles of managerial microeconomics do indeed allow accurate predictions of managerial decisions, and that profit maximization provides a useful assumption in that context. Indeed, no general theory has yet proven to predict more accurately than the models based on profit maximization. Thus, in this book it will be assumed that the objective of the firm is to maximize profit or, equivalently, to maximize the value of the firm.

Constrained decision making

The essence of the science of economics is determining optimum behaviour where that behavior is subject to constraints. As just discussed, profit maximization is constrained by the limited information available to the manager. In general, constraints on managerial decisions involve legal, moral, contractual, financial, and technological considerations. Legal constraints include the array of federal, state, and local laws that must be obeyed by all citizens, both individual and corporate. Areas where managers seem to be having some legal difficulty include environmental laws, especially those relating to pollution and the disposal of hazardous wastes, and employment law, including wrongful termination and sexual harassment matters. Moral constraints apply to actions that are not illegal but are sufficiently inconsistent with generally accepted standards of behaviour to be considered improper. Contractual constraints bind the firm because of some prior agreement such as a long-term lease on a building or a contract with a labor union that represents the firm's employees.

Finally, there are financial and technological constraints. An example of a financial constraint occurs when a department of a firm is assigned a budget for the forthcoming production period and managers are given orders such as 'maximize production subject to this budgeted amount.' Technological constraints set physical limits on the amount of output per unit of time that can be generated by particular machines or workers. As will be shown in subsequent chapters, making optimizing decisions under financial or technological constraints is a fundamental part of managerial economics.

End notes

2 This section draws on the classic article by R.H. Coase, 'The Nature of the Firm.' *Economica,* November, pp. 386–405, 1937.

3 Some managers who must report profit performance monthly or quarterly claim that the pressure for increased short-term profits may cause them to make decisions that increase these profits at the expense of long-term profit.

4 Many students will have already studied the concept of present value. For those who have not, the concept is developed more fully in the appendix to this chapter.

5 See H.A. Simon, 'Theories of Decision Making in Economics,' *American Economic Review,* 49(3):253–283, 1959; and R.M. Cyert and J.A. March, *A Behavioural Theory of the Firm* (Englewood Cliffs, N.J.: Prentice-Hall, 1963).

6 F. Machlup, 'Theories of the Firm: Marginalist, Behavioral Managerial,' *American Economic Review,* 57(1):1–33, 1967.

Source: Petersen, H.C. & Lewis, W.C., *Managerial Economics,* 3rd edn, Macmillan, New York, 1994, pp. 7–11.

Perfect competition and monopoly

Topic 8

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Introduction

The last topic emphasised the importance of equating marginal benefits with marginal costs to identify profit maximising levels of output. This principle of equating MR with MC is fundamental to rational decision making and can be applied to virtually every decision the firms confront. It is just as relevant to determining the optimal level of advertising as it is to identifying the optimal level of output. The answer a manager will get from applying this principle to any problem depends on the characteristics of the firm and its production and cost structures, and we have spent some time analysing this already. The answer will also depend on the competitive conditions confronting the firm.

Identical firms with identical objectives could well make different decisions if they are confronted with different competitive conditions. Moreover, not only might their decisions be different but the implications of these decisions for the wider community could be poles apart.

It is important that we understand this link between managerial decision making and competitive pressures for at least two reasons. First, from a private perspective, you cannot make good decisions about running your firm if you don't understand what other firms in the industry are doing and why. Second, appropriate public policy in areas like trade practices and mergers and acquisitions requires that the implications of private firm level decision making are understood and anticipated.

Topic 8 is the first of two topics dealing with the behaviour of firms under different competitive conditions. In this topic we examine and contrast the behaviour of firms in *perfectly competitive* markets with that of firms in markets that are *perfect monopolies*. In each case the characteristics of the industry structure are defined. The optimising rule of equating marginal revenue to marginal cost that was developed in the previous topic is used to explain the implications of these market characteristics for pricing and output decisions.

Both *perfect competition* and *perfect monopoly* are stylised models of competitive conditions. Neither is likely to exist in a pure textbook form in the real world. We study these stylised markets so we can focus on the implications of key aspects of competitive conditions in real markets. In this case particular attention is focused on explaining the way the existence of *market power* and *barriers to entry* influence the behaviour of profit maximising firms.

The analysis builds on the work in previous topics on the nature of markets and cost curves, so make sure you have covered these issues before you commence work on this topic.

Objectives

On completing this topic you should be able to:

- define the economist's concept of a market;
- state and explain the significance of conditions for the existence of perfect competition;

- explain the difference between the demand schedules faced by the perfectly competitive industry and the perfectly competitive firm;
- identify the profit-maximising condition for a firm;
- explain the difference between abnormal and normal profit, and state the conditions under which they occur;
- distinguish between short-run equilibrium and long-run equilibrium for a perfectly competitive firm;
- identify a monopoly;
- outline various barriers to entry to a market;
- assess the price and output decisions of a monopolist; and
- distinguish between first, second and third degree price discrimination.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, Chapter 9.

Readings

Reading 8.1
E.K. Hunt & H.J. Sherman
'Some features of the market concept'

Reading 8.2
R. Dorfman & N. Norman
'Investment decisions'

Reading 8.3
R.G. Lipsey
'Ball-point pens'

The market

Australia is a mixed economy. As such it combines traditional, command and market features but is considered by many people to be biased toward a market system.

Let us then start by asking 'What is a market?'. You probably have some ideas.

Question 8.1

State in less than 30 words what you understand a market to be. (Refer to the 'Suggested answers' when you have finished.)

While we don't want you getting bogged down in definitions, there are a few points worth noting here. Some definitions of a market refer only to final outputs. You should recall that there are factor markets as well, although in this unit we will be paying most of our attention to final output markets. You will also probably be aware that marketers tend to view a market as just the set of buyers for a product or service (Kotler et al. 1994, p. 324). Economists would argue that this is just a part of the market.

An explanation of some features of the market concept are given in Reading 8.1. Although reference is made to the United States of America, the comments are also applicable to Australia.

☐ *Read Reading 8.1.*

Question 8.2

What do you judge to be the major points raised in the article?

Another point to note is that markets vary widely in their physical form. They may exist in specific compact locations, e.g. wholesale fruit and vegetable markets in Australian capital cities or gold markets in major world financial centres. Most markets are, however, widely dispersed. For consumer durable goods such as motor vehicles and household appliances, most producers are servicing state or national markets containing large numbers of potential customers. For other commodities such as famous paintings, markets are worldwide, although their members—e.g. art dealers, collectors, museums—are relatively few. The definition of a market is in fact a difficult task.

What is the difference between a market and the market system?

This is a deceptively simple question, but the answer is complex. In general terms, a *market system* can be described as a procedure whereby commodities or resources are distributed. Exchange occurs between sellers and buyers, for a price. There are alternative methods of distribution, which can be classified as either traditional or command. For example:

- In a *subsistence economy,* food is grown or hunted and then shared among members of the community; similarly, if you have a tree laden with apples, you may share them with your neighbours.
- In a *command economy,* products are distributed at the direction of those in command; similarly, the Australian government decides on the distribution of welfare payments.

It should also be noted that there are different market structures in the market system, ranging from pure competition through monopolistic competition and oligopoly to pure monopoly.

In this unit, the term 'market economy' has been used in an extreme way, meaning a 'pure' market economy, i.e. an economy where all the markets are purely competitive. Less pedantically, the term 'market economy' (or 'market system') acknowledges the existence of different market structures in an economy. The economy must still be devoid of traditional or command elements however, or it becomes a mixed economy.

A perfectly competitive market

We have just raised the issue of different market structures in an economy. One extreme form of market structure is the perfectly competitive market, a market with a number of definitive features.

☐ *Read Begg et al. (2000), pp. 126–8 (up to Section 9-2) for a discussion of these characteristics.*

A *perfectly competitive market* is one in which the following conditions exist:

- There are a very large number of firms in the market.
- Each firm (seller) is so small in the market that it has no ability to control the product price.
- It is easy for firms to enter or leave (exit) the market.
- The product from each firm is identical (including price), so consumers are indifferent about which firm in the industry produced the item they buy.

Can you identify some markets where the firms have no ability to control or influence product price?

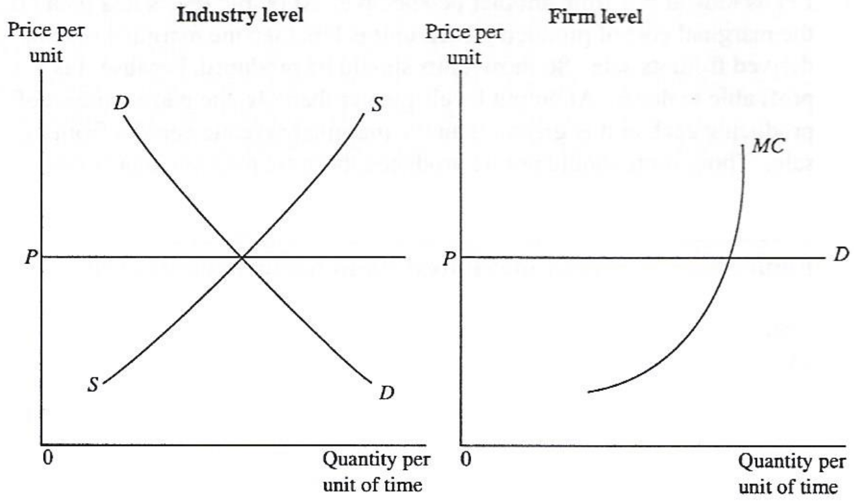
Demand and price in perfect competition

The concepts of demand, supply and equilibrium were introduced in topics 1 and 2. You will realise, therefore, that if the determinants of demand and supply, other than price, are constant, an industry can sell a larger quantity only if the price falls. In other words, the demand schedule faced by the *industry* is normally sloped, i.e. it is consistent with the law of demand, and slopes downward from left to right.

This is not the case for the demand curve for an *individual firm* in a perfectly competitive market. Each firm is so small in the market that the quantity it chooses to sell will not affect the market price of the product. This means that each firm can sell whatever quantity it wishes at the market price. Therefore, the demand curve faced by the firm in a perfectly competitive market is horizontal, i.e. perfectly elastic.

Figure 8.1 shows the demand curves for a perfectly competitive industry and for a single firm in that industry. The vertical axes are identical. The horizontal axes are numerically different since output from all the individual firms constitutes the industry output.

Figure 8.1: Demand schedules for the purely competitive industry and firm



Note that each purely competitive firm is a price taker. The equilibrium price for the product, *P*, is determined in the marketplace, through the interaction of demand and supply. Given that market price, each firm decides what quantity to sell. The firm has no power to vary the price upwards and presumably has no desire to vary it downwards. Later in this topic we will see that this is not the case in monopolistic markets. In Topic 9, we shall see that this is also not the case in *oligopolistic* markets.

Given that the price is fixed for a firm, how do they decide on the quantity to sell? This question we take up in the next section.

Profit maximisation and equilibrium in perfect competition

In this section, we use the demand, supply and cost theory explained in previous topics to see how the perfectly competitive firm, knowing the market price of the product and its costs of production, would decide on the quantity to sell.

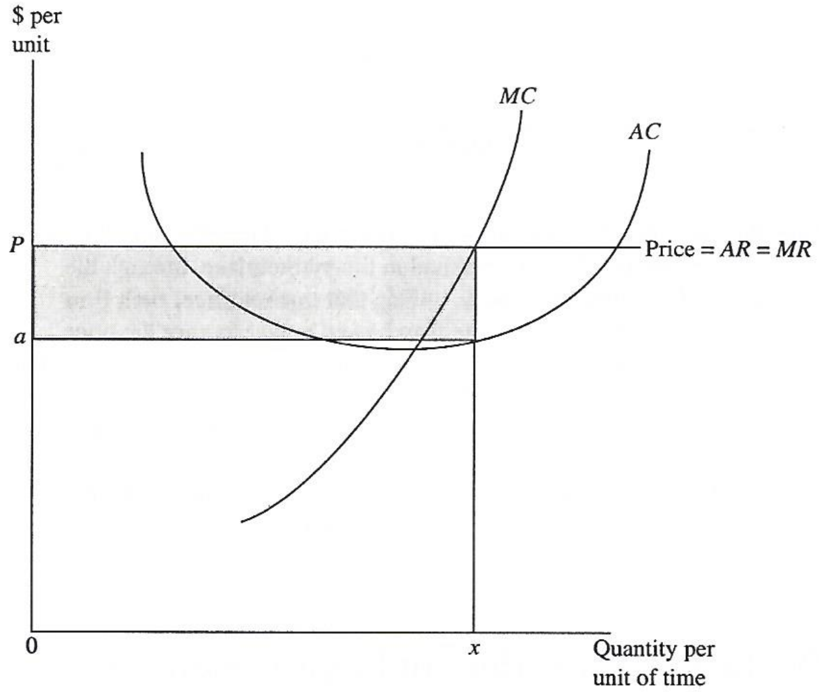
If it is assumed that the firm wishes to maximise profit, then it will want to produce and sell the quantity at which marginal cost equals marginal revenue. This is the short-run equilibrium position for the firm.

Remember that *marginal revenue* (*MR*) is the revenue derived from selling the last unit of output and *marginal cost* (*MC*) is the additional cost associated with the production of the last unit of output. In the case of a firm in a perfectly competitive industry marginal revenue is constant and equal to market price. Marginal cost will tend to increase as output increases.

Figure 8.2 illustrates the profit-maximising output level for a purely competitive firm. That output level is *Ox* where *MC* equals *MR*. This means that if marginal revenue is greater than marginal cost, the firm is producing too little output and profits are sub-optimal. Similarly, if marginal revenue is less than marginal cost the firm is producing too much, and profits would increase (or losses fall) if output was reduced.

Let us look at this from another perspective. At output levels less than *Ox*, the marginal cost of producing each unit is less than the marginal revenue derived from its sale. So those units should be produced, because it is profitable to do so. At output levels greater than *Ox*, the marginal cost of producing each unit is greater than the marginal revenue derived from its sale. Those units should not be produced, because they are unprofitable.

Figure 8.2: Profit maximisation in perfect competition



There are some other important points you should note about Figure 8.2.

- Average revenue (*AR*) equals total revenue (*TR*) divided by quantity sold. Thus, in Figure 8.2, average revenue is *OP*, and total revenue is *OP* times *Ox*.

- In Figure 8.2, total cost (*TC*) is *Oa* times *Ox*. Since total revenue is *OP* times *Ox*, abnormal profit is (*OP* – *Oa*) times *Ox*; i.e. *aP* times *Ox*, or total revenue minus total cost (the shaded area in the graph).

Normal profit is earned when average revenue equals average cost. Normal profit is defined as that amount of profit that is just sufficient to enable the firm to stay in business. Note that normal profit is a cost of production because it represents the opportunity cost on the owner's resources tied up in the industry.

Profit above the normal profit level is called abnormal, supernormal or excess profit. A loss is made when average revenue is less than average cost.

To summarise:

$AR > AC \rightarrow$ Abnormal profit: $TR > TC$

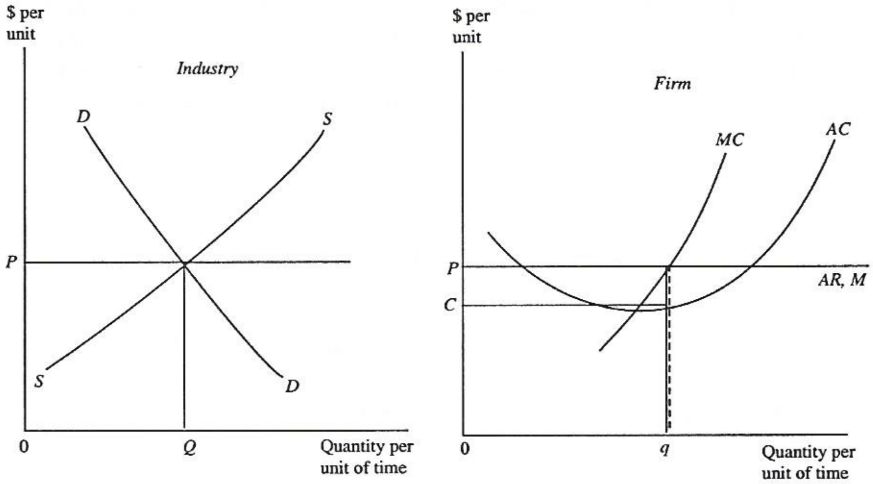
$AR = AC \rightarrow$ Normal profit: $TR = TC$

$AR < AC \rightarrow$ Loss: $TR < TC$

☐ *At this point, review your understanding of a firm's supply decision under perfect competition by reading Section 9-2 in Begg et al. (2000), pp. 128–31.*

Figure 8.3 shows a *short-run equilibrium* condition for a perfectly competitive industry and a firm. The industry price is determined in the market through the interaction of demand and supply. Given that price, and knowing its production costs, each firm decides the output level to produce. Figure 8.3 concisely brings together the market equilibrium explained in Topic 2 and the firm's short-run equilibrium discussed above.

Figure 8.3: Short-run equilibrium



Because abnormal profits are being made in the industry depicted in Figure 8.3, and because it is easy for new firms to enter a perfectly competitive industry, new firms will be attracted to this industry. It is important to note that this industry is therefore not in *long-run equilibrium*.

Firms can enter and leave a perfectly competitive industry without incurring costs. An industry is in long-run equilibrium when there is no tendency for firms to enter or leave that industry. This condition is only met when no economic losses or economic profits are present. In long-run equilibrium all firms will be earning normal profits.

☐ *Read Section 9.4 (pp. 133–6) which explores what happens to equilibrium when certain changes occur in a purely competitive industry. (This should prepare you for the questions that follow.).*

Question 8.3

Briefly answer each question. Support your answer in each case by a sketch.

What happens to the price received by, and the output level of, the purely competitive firm in each of the following situations:

(a) There is a bumper crop in the industry?

(b) There is a significant switch of consumer preference away from other products toward the one produced by the purely competitive industry?

(c) There is a bumper crop in the industry which is accompanied by an increase in the amount of money consumers have to spend on the commodity?

☐ *Now read Reading 8.2 by Dorfman and Norman. In this reading some of the concepts of costs, profits and equilibrium, with which you are now familiar, are used in the consideration of investment decision making. When you have finished the reading, answer the following two questions.*

Question 8.4

Dorfman and Norman detail a simple two-point rule for investment decision making. That rule involves converting the capital costs of the proposed investment into an annual flow, and comparing that to the anticipated annual earnings or savings resulting from the proposed investment. Reference is also made to an alternative method of assessing an investment.

(a) What is that alternative method?

(b) Write down a two-point rule for this alternative method of investment evaluation.

(c) Under what conditions would investment be advisable?

(Answer each question in one or two sentences.)

The analysis above has all revolved around the notion of applying the principle of equating marginal revenue with marginal cost in a market where firms have no market power (as evidenced in their inability to influence market price by varying output), and where there are no barriers to prevent firms entering or leaving an industry. We saw that in a perfectly competitive market, greater than normal profits cannot be sustained in the long run. It also logically follows from the assumptions underpinning this model that firms do not have price changes as a strategic variable available to them.

We now relax the assumptions of no market power and no barriers to entry and consider the case of perfect monopoly.

Monopoly

A *monopoly* is a market situation in which a single firm is the sole producer of a particular product for which there is no substitute.

Given this definition you will appreciate that it is unlikely that very many (if any) pure monopolies actually exist. Whilst a single firm may be the sole producer of a particular product, substitutes are available for most (dare we say all?) commodities.

Reflect on the truthfulness (or otherwise) of the paragraph above. Do not limit yourself to the role of a domestic consumer. Put yourself also (mentally) in the position of a manager of various organisations.

Although pure monopoly is unlikely, there are instances where there is a sole producer of a product where some, perhaps limited, substitutes are available.

Monopolies generally exist because there are barriers which prevent the entry of additional firms to the market.

Typical barriers to entry

There are a number of barriers to entry—we outline five typical ones here.

Economies of size in production

In an industry where there are significant economies of size in production, it will be difficult for a new firm to enter the industry. The potential rival must either immediately attract a large share of the market or operate on a smaller, less efficient size. In either case there is likely to be a lengthy period when the firm is less profitable than its rivals. A current example in the Australian context might be the telecommunications industry.

This problem is accentuated where the market is not large enough to support two, or more, large firms. (This leads to a *natural monopoly,* e.g. some aspects of the operation of public utilities.)

Advantages of being established, or absolute cost barriers

The established firm, by its existence, presents several barriers to a potential rival. Some of the advantages an established firm has are:

- an experienced workforce;
- established marketing channels;
- possible control over sources of raw materials (e.g. iron ore in the case of BHP);
- patent rights;
- secret knowledge (e.g. Coca Cola formula);
- possibly less expense in raising finance (e.g. established firms may finance expansion from depreciation allowances).

Tariff protection

Tariffs protect domestic producers by deterring imported goods. However, there is an alternative argument that tariff protection may encourage foreign firms to establish in the home country within the protected environment.

Product differentiation and advertising

Existing producers may have the advantage of an established name, the benefits of goodwill, and an image in the minds of the public. These advantages will have accumulated as a result of past activities and a new entrant is likely to incur costs in addressing these issues. The industry may also be one in which there is considerable advertising (more so in oligopoly than in monopoly). In such a case the entering firm may be faced with large expenditure in this area.

Government legislation

Governments sometimes legislate to limit the number of firms able to operate in an industry. In Australia there are, or have been, entry restrictions placed on a wide range industries including banking, airlines, taxis and universities.

These restrictions are important because they are absolute. All the other barriers to entry can be breached if a firm has enough resources.

Price and output determination under monopoly

You will recall from earlier in this topic that in a perfectly competitive market:

- the demand schedule faced by each firm is horizontal;
- the demand schedule faced by the industry is downsloping from left to right.

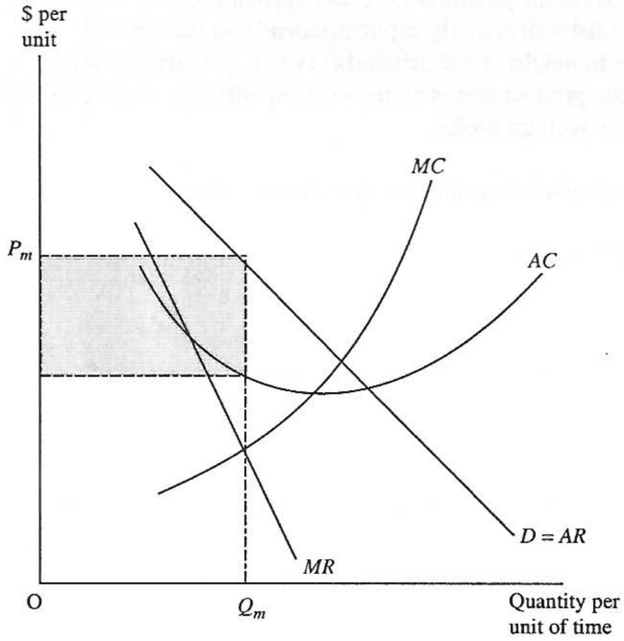
In a monopoly market, the demand schedule faced by the monopolist is also the industry demand schedule, i.e. the monopolist can:

- sell more by reducing price; or
- increase price, accepting a reduction in sales.

The profit maximising output for any firm, including a monopolist, is reached when $MC = MR$. Because a monopolist faces a downward sloping demand (AR) schedule, the MR schedule lies always below the AR schedule. That is, $MR < AR$ at any output level.

Figure 8.4 depicts the profit maximising output and price for a monopolist.

Figure 8.4: Profit maximisation for a monopolist



☐ *Begg et al. (2000), sections 9-6 and 9-7 (pp. 137–41), explain more fully this profit maximisation behaviour.*

Question 8.5

Explain in a few words why, in the case of monopoly, marginal revenue is less than price at each level of output. An intuitive answer is possible. Careful study of Figure 8.4 may help.

There are two important alternatives to consider when analysing the implications of barriers to entry, i.e. whether entry to the industry is:

- *blocked,* i.e. entry is impossible, or
- *restricted,* i.e. entry is possible, with differing degrees of difficulty.

We briefly consider each of these situations.

Blocked entry

Figure 8.4 shows the situation for a monopolist protected from competition. Assuming the objective of short-run profit maximisation, the monopolist would produce (and sell) quantity Q_m where $MC = MR$, and charge P_m per unit.

Notice that at the output level Q_m:

- abnormal profit is made (AR or price $> AC$);
- the firm is not operating at minimum AC—i.e. it has excess capacity;
- $P_m > MC$, indicating a misallocation of resources between industries.

It is important to remember that barriers to entry, market power and the status of a monopoly do not guarantee greater than normal profits. These conditions only provide the potential for super normal profits. The level of profits a monopolist will actually capture depends on the costs of production relative to height of the demand curve. If you are the only producer of a unique product that is either very expensive or of no value to consumers, you may well go broke.

See if you can sketch other diagrams to show the following:

- *normal profit (P = AC);*
- *a loss (P < AC).*

We must note too that a monopolist may not aim for short-run profit maximisation.

Question 8.6

What objectives, other than short-term profit maximisation, might a monopolist have?

Possibly some of your answers to Question 8.6 have taken us out of the realm of blocked entry, so we hastily turn to restricted entry.

Restricted entry

Entry to an industry is not usually blocked unless government intervention provides an insurmountable entry barrier. Where the threat of rival entry exists, and entry is possible, a monopolist can maximise short-run (presumably abnormal) profit. In doing so, the monopolist attracts the rival to enter and accepts a fall in profits, which nevertheless may still be abnormal. A monopolist is likely to choose this course of action when entry barriers are weak.

☐ *Now read Reading 8.3 which gives an example of this situation, and in which the author summarises the way in which certain aspects of economic theory are validated by this case.*

Alternatively, the monopolist can hold price below the short-run profit maximising level, thus accepting a cut in short-run profits (which can still be abnormal) with the aim of deterring entry by a potential rival. This course of action is likely to be chosen when entry barriers are reasonably strong.

Can you think of examples from your experience that parallel the ball-point pen example?

Natural monopoly

The case of natural monopoly is outlined on p. 143 of Begg et al. (2000). In essence, an industry is a *natural monopoly* if the *LRAC* curve is downward sloping over the entire output range where demand is higher than the *LRAC*. This means that one firm will always be able to supply the industry demand at a lower *production cost* than two or more firms.

☐ *Read Section 9-8 in Begg et al. (2000), pp. 141–3, for a discussion of these points. (Such discussion occurs in the context of a comparison between a perfectly competitive industry and a monopoly.)*

The conditions for a natural monopoly are commonly met for parts of the operations of many public utilities. For example, the electricity lines for power transmission and distribution probably represent a natural monopoly, as do the tracks for rail transport.

The presence of a natural monopoly has important implications for industry policy, and these will be taken up in Topic 10. At this stage you should note that if governments regulate the operation of natural monopolies so that they must operate at output levels consistent with the point where demand equals marginal cost—and charge prices consistent with marginal cost—the firms will make losses. This creates an interesting public policy dilemma—allocative efficiency from a societal perspective and profitability are *potentially* conflicting objectives.

Absence of a supply curve under monopoly

In a perfectly competitive market the individual firms supply curve is given by the segment of the marginal cost curve above the point of intersection with the average variable cost. The industry supply curve is just an aggregation of the supply curves for each firm. There is no equivalent a priori supply curve that can be identified for a monopolist. That is, there is no unique relationship between price and quantity supplied.

☐ *This issue is addressed in Section 9-9 in Begg et al. (2000), pp. 143–4. Read up to 'Discriminating monopoly'.*

With market power, firms are confronted with choices over what price to charge and what quantity to produce. Firms may not be profit maximising in the short run and, even if they are, we need information on both marginal cost and marginal revenue before we can identify likely output levels. The price is obtained by reference to the demand curve. Looked at from another perspective, it means that we cannot identify likely quantity supplied with information on industry price alone.

Question 8.7

Consider the case of a monopolist who confronts the following demand curve:

$$P = 9 - Q.$$

where

P = ***price per unit in $***

Q = ***quantity sold***

The marginal cost of production for the firm is constant and equal to $5.

What is the profit maximising quantity and price for this firm?

Price discrimination

Price discrimination is a pricing strategy potentially available to many monopolists and other firms with market power. Price discrimination is the charging of different prices for the same commodity. Caution needs to be exercised in identifying price discrimination because if different prices of a commodity are solely due to different costs (e.g. petrol prices—city and country), then this is not price discrimination. To make matters worse, price discrimination may occur even when there are differences in cost. For example, if the differences in prices are greater than the differences in costs, then there is price discrimination.

Economists distinguish three types of price discrimination. We consider each of these in turn.

First-degree price discrimination

This involves charging a different price for each unit sold. The outcome is that there will be no consumer surplus. All the surplus would be captured by the monopolist. While this is unlikely to be a viable option for most firms but it could be appropriate to firms selling small numbers of a highly specialised good or service to a small number of customers. To be viable it is also necessary to ensure that no resale is possible between customers.

Second-degree price discrimination

This occurs when a seller charges different prices for a commodity to the same buyer. For example, a garden nursery may sell rhubarb crowns at $2.75 each or $8.00 for five.

Third-degree price discrimination

This occurs when a seller charges different prices for a commodity to different buyers. For example, we sometimes hear of a commodity being sold abroad at a lower price than is charged in the producing country. Another example can be found in electricity consumption. If you compare the prices per unit charged to industrial and domestic consumers you will probably find that the industrial consumer pays a lower rate.

Reflect on why this should be so. What does this tell you about industrial and domestic consumers' elasticity of demand for electricity?

Third-degree price discrimination is only possible where the three following conditions are satisfied:

- Different markets for the commodity exist and movement of the commodity between them is impossible or very difficult. (Otherwise Joe Blow can purchase in the 'cheap' market and sell in the 'expensive' market at a profit. This arbitrage would bring the two prices together.)
- The price elasticity of demand is different in the different markets. (Consumers with more inelastic demand for the commodity will pay a higher price.)

- Any costs involved in separating the markets must be less than the revenue derived from their separation.

☐ *Now read 'Discriminating monopoly' in Begg et al. (2000), pp. 144–6.*

Why is price discrimination profitable for a monopolist to employ?

Summary

In this topic we have covered a lot of ground, from perfect competition to monopoly. We looked in detail at how price and output levels are determined in both market structures. The perfectly competitive model assumes no market power and no barriers to entry. The key strategic decisions facing firms in this model are what technology to use and what level of output to produce. With perfect competition we saw that while firms can make economic profits in the short run, the condition of costless entry and exit means that only normal profits are achievable in the long run. The case of monopoly is different. Monopolists have market power so they have the additional strategic variable of price. Monopolists are also protected by barriers to entry and exit which provide them with the potential to sustain economic profits in the long run.

From a policy perspective we found that, in comparison to a competitive market, monopolists tend to produce less and charge higher prices. The problems this creates for governments that are concerned safeguarding the interests of consumers will be considered in topics 10 and 11.

Strategic interaction between firms is a major feature of competitive behaviour not covered in this topic. In perfectly competitive markets strategic interactions are irrelevant as firms cannot influence market outcomes. In a monopoly there are no rivals to consider. In the following topic we introduce this added dimension of strategy in the context of imperfect competition and we consider two additional market structure models—*monopolistic competition* and *oligopoly.*

Review questions

Review question 8.1

In a two-column table, compare and contrast the characteristics of a purely competitive market with a monopoly.

Review question 8.2

Suppose that you are the owner of a metals-producing firm that is an unregulated monopoly. After considerable experimentation and research you find that your marginal cost curve can be approximated by the following straight line:

$MC = 60 + 2Q$

where MC ***= marginal cost in $, and***
Q ***= output level.***

You also know that your demand curve is $P = 100 - Q$, where P is the product price. From this you know the marginal revenue curve is $MR = 100 - 2Q$.

(a) What would be your profit maximising level of output and price?

(b) What additional information would you need to calculate your profit level?

Review question 8.3

People often argue that a perfectly competitive industry is the ideal form of industry for the community at large and so it should represent a policy goal.

(a) Compare a perfectly competitive industry with a monopoly to explain why the former is seen as welfare enhancing while the latter is seen as welfare diminishing.

(b) Under what circumstances would the creation or maintenance of a monopoly be welfare enhancing?

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Suggested answers

Topic 8

In-text questions

Question 8.1

What is a market?

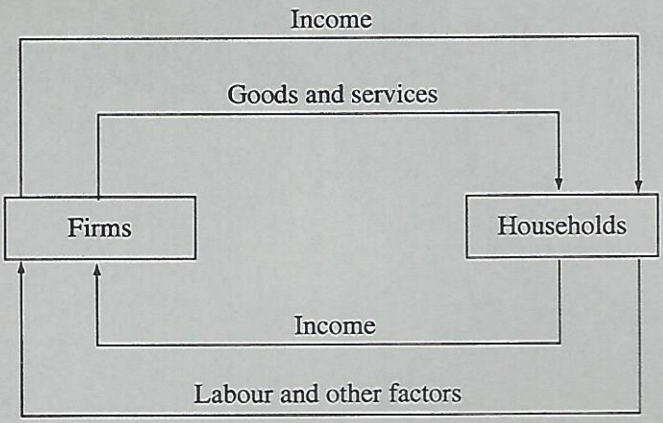
According to Mansfield (1994), 'a good working definition of a market is that it is a group of firms and individuals in touch with each other in order to buy or sell some good.'

Lipsey (1971) defines a market as 'an area over which buyers and sellers negotiate the exchange of a well-defined commodity.'

Question 8.2

Main points of Reading 8.1

- A private enterprise economy is one in which individuals own the means of production. In modern, technologically complex economies, individual independence is impossible and the individual productive contribution is sometimes insignificant.
- Demand for the workers' labour derives from the demand, by a large number of people, for goods and services. These exchanges take place in the market.
- In the market system the motive for the production of goods and services is profit. During the productive process, income flows to consumers because they provide labour or other factors of production; this income is part of the producers' cost of production. This simple microeconomic circular flow can be diagrammatically depicted.



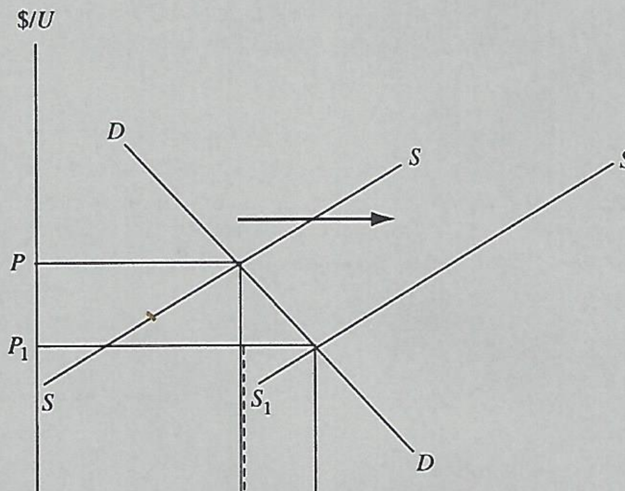
- While the term 'market' may refer to a particular geographic area, e.g. the Victoria Market m Melbourne, it is more usually an abstract concept. A market is a situation where buyers and sellers interact and exchange money for goods or services. (Note that this is a further definition of a market. Note also the reiteration of the definitions of demand and supply with which you became familiar in Topic 2.)
- The operation of the market hinges on the circular flow of money. Desire for goods or services is insufficient to make the system work; that desire must be accompanied by the ability to pay.

You may, of course, have highlighted some other points. The reading may have provoked an emotional response from you, in which case your summary may have included some assessment of the points raised.

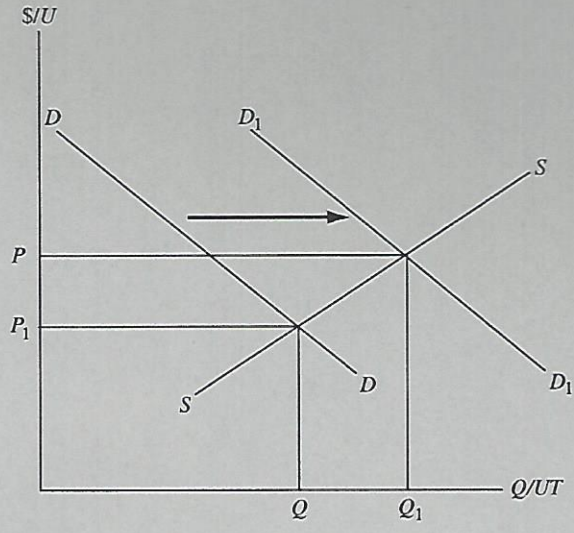
Question 8.3

Demand and price in perfect competition

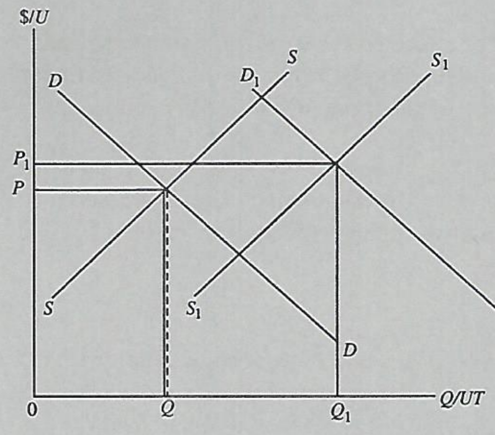
(a) The increased supply of the commodity from the bumper crop causes the supply schedule to move out to the right. The output increases and price consequently falls.

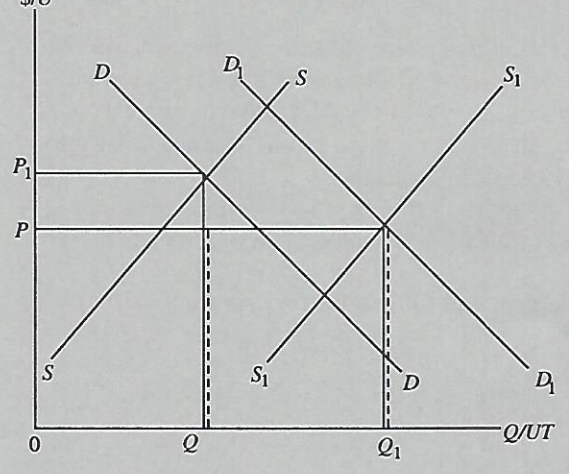


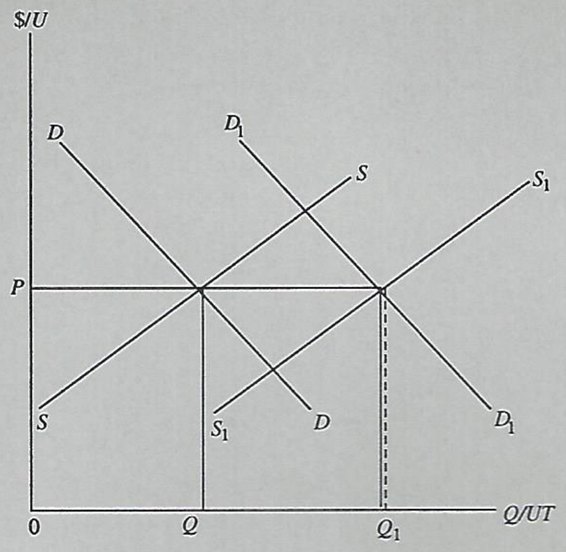
(b) A switch in preferences in favour of the commodity produced means an increase in demand, i.e. the demand schedule moves upward to the right. The price increases and in response output increases.



(c) The bumper crop means that the supply schedule moves out to the right as in part (a) of the question. The increased spending power of consumers is likely to cause an increase in demand which means that the demand schedule will move upward to the right. The output is increased but it is not possible to predict what would happen to price unless the precise relative shifts in the supply and demand schedules are known. Price may increase, decrease or remain constant as shown in the following sketches.







Question 8.4

Investment decisions

(a) It is the comparison of the capital costs of the investment with the 'present value' of the anticipated earnings or savings resulting from the proposed investment.

(b) (i) Calculate the total capital costs of the proposed investment.

(ii) Estimate the expected earnings or savings from the proposed investment and convert this to 'present value'.

(c) Invest if the 'present value' of expected earnings or savings is greater than the total capital costs of the proposed investment. Note Dorfman and Norman's cautionary note on the likely difficulty of making the necessary estimates.

This question introduces the concept of 'present value'. Explanations of how to make these types of calculation are covered in other units.

Question 8.5

Arithmetically, a declining average means that the associated marginal value must be lower than the average. Effectively, *MR* lies below *AR* because it is the *MR* being less than *AR* that pulls down *AR* and leads to the downward sloping *AR*.

At any particular price or *AR*, all units are sold at the same price. To sell one more unit, price must be lowered on all units sold and not just the additional unit. The impact of the sale of an additional unit on total revenue will always be less than the new price (or *AR*) because there are two revenue impacts from any additional sale:

- the impact of the extra unit sold (positive and equal to *AR*); and,
- the impact of the additional unit sold on the revenue from existing sales (negative and may be less than, equal to, or greater than *AR*).

When the second impact is greater than *AR*, *MR* will be negative.

Question 8.6

There are a large number of possible objectives such as:

- long-run profit maximisation;
- reducing risk to profit stream;
- maximisation of SR share value;
- executive salaries; and,
- market share.

Question 8.7

First find *MR*

If $P = 9 - Q$ then $MR = 9 - 2Q$ because *MR* has twice the slope of a straight line demand curve.

$MR = MC$ gives the profit maximising level of output.

$$9 - 2Q = 5$$

or

$$Q = 2$$

To find *P* just substitute *Q* into the demand equation.

$$P = 9 - 2$$

or

$$P = 7$$

Review questions

Review question 8.1

There is no specific feedback for this question. You should carefully review Begg et al. (2000) and the notes of this topic.

Review question 8.2

(a) Set $MR = MC$ to find Q:

$$60 + 2Q = 100 - 2Q$$

$$4Q = 40$$

$$Q = 10$$

Substitute into demand equation to get *P*:

$$P = 100 - 10 = 90$$

(b) You would need to know the average cost curve or total cost curve to be able to calculate the level of profits. The level of *P* and *Q* provide the level of revenue.

Review question 8.3

(a) Perfect competition results in $P = MC$ or allocative efficiency in a societal sense. There is no deadweight loss associated with this market structure.

Monopoly is not allocatively efficient in that $P > MC$ so producing a deadweight loss due to over production. It *tends* to result in less output and higher prices than would be the case under perfect competition.

(b) A monopoly may be the most efficient form of market structure when:

- substantial size is necessary to invest in research and development to foster further development in the industry; or,
- the industry has the characteristics of a natural monopoly.

Some features of the market concept

Reading 8.1

E.K. Hunt & H.J. Sherman

A private enterprise economy is one in which the factories, tools, and stocks of goods with which production is carried on are owned by private individuals. Individual ownership includes, of course, the corporate form of ownership. In the corporation individuals own the whole capital, but each person's ownership is specified in the form of the stock or shares that he or she holds.

Most modern private enterprise economies are distinguished by socially and technologically complex methods of production and distribution. It is possible to imagine an economy of small farmers and artisan-producers in which each individual owns his or her own means of production and is a fairly independent producer. In the reality of the modern private enterprise economy, however, this type of individual independence is completely impossible. The factory system, ushered in by the Industrial Revolution, has made individual producers completely dependent. A worker in an automobile factory, for example, owns no tools of production. Alone, one worker cannot produce anything. Individual workers depend for continued existence on being able to sell their labor time to a company that employs hundreds of thousands of other workers. Their work generally consists of one small, insignificant, and tedious operation (such as screwing a particular nut onto a particular bolt) repeated endlessly for 8 hours each day.

In the American economy about 1.8 per cent of the population owns 80 per cent of all corporate stock. Most of the remaining 98.2 per cent own little or no capital and depend on the *market* for their labor services to earn a living. Workers who succeed in selling labour services are paid a wage that is then spent in the market for goods and services. By purchasing these goods and services, the individual worker plays a small (usually *very* small) role in creating the demand that provides jobs for the other workers who produce these goods and services. In fact, in the U.S. economy the continued employment of any individual may depend on the actions and behavior of hundreds of thousands or even millions of other people. All these people are related to this individual through only one social institution—the market. It is therefore vitally important to understand how the market functions.

In a private enterprise economy the market determines what is to be produced. Capitalists, or their hired managers, are motivated primarily by the drive to maximize profits. They use the market to hire labor and buy raw materials, which they combine with the factories, machinery, and tools they own in order to produce an output. Many capitalists are strictly intermediaries and financiers and are not directly connected with productive output, but we shall examine only those who do own a productive facility. They sell their output in the market.

Their objective is to maximize the difference between their sales proceeds and their money expenses incurred in buying raw materials, hiring labor, and replacing used-up capital. This difference is, of course, profits. They constantly search for commodities that can be produced and solid profitably.

The capitalists' costs of production represent income to laborers and the owners of raw material. Profit is the income the accrues to the capitalist. The recipients of these incomes spend them in the market for the goods produced by the capitalists' business firms. Thus money circulates from the business firms to the general public in the form of incomes generated in the production process. The money then returns to the business firms when the public purchases the goods and services these firms sell in the market.

There is thus an amazingly complex circulation of money from hundreds of thousands of business firms to hundreds of millions of people and back into the hands of the business firms. At all points the guiding force is the capitalists' constant search for profits. The decisions concerning what goods to produce (or even whether to produce), what inputs to buy, what wages to pay, and so forth are all determined by the criterion of profitability. All economic relations between people are mediated by the institution of the market. The market is obviously one of the most important social institutions in a private enterprise economy…

It is important to begin by distinguishing a particular market from the market system (or, as it is often referred to, *the* market). Historically, a market was an area, usually near the center of a village or town, where producers and traders would meet and exchange goods. Later, any place where a merchant regularly sold commodities was a market. Today the word *market* is sometimes used to refer to a grocery store, but is more generally used as an abstract concept. It refers, in this usage, to the negotiation and exchange transactions that normally involve money, and the determination of the prices at which these exchanges are transacted.

We speak of the stock market, the labor market, or the automobile market when we are referring to the buying and selling of stock, labor services, or automobiles. We speak of the market or the *market system* when we wish to refer to monetary exchange and price determination in general. It is obvious that any market system that successfully facilitates price determination and exchange must contain complex systems of customs and traditions, laws and agencies of law enforcement, as well as the physical buildings in which business is transacted …

A market is basically a two-sided phenomenon, with buyers facing sellers. Buyers have money they wish to exchange for goods, and sellers have goods they wish to exchange for money. The amount of the good a buyers would like to purchase at any given time is referred to as the *demand* for that good. Similarly, the amount of the good that sellers would like to sell is referred to as the *supply* of the good.

It should be stressed that demand is not necessarily related to need or desire. A penniless child longingly gazing through the window of a candy store adds nothing to the market demand for candy. Similarly, in the Great Depression of the 1930s millions of people went hungry while tons of wheat and thousands of cattle and sheep were destroyed and wasted because of the lack of any market demand for them. The problem, of course, was that, like the child at the candy store, the unemployed millions had no money to exchange for food.

Source: E.K. Hunt & H.J. Sherman, *Economics: An Introduction to Traditional and Radical Views,* 5th edn, Harper & Row, N.Y., 1986, pp. 207–9.

Investment decisions

Reading 8.2

R. Dorfman & N. Norman

We have been analysing the most profitable level of output of a firm, regarding its current plant and organisation as given (i.e. the short run). The decisions discussed in this context therefore concern the economical use of the plant and equipment currently available to a company or, to take a larger view, of a whole industry or economy. But the growth and prosperity of a company, or the development of an economy and the wealth of its members, depend on different kinds of decisions, decisions to invest and thereby to enlarge the stock of fixed capital. These are the decisions that really have the far-reaching and long-lasting consequences.

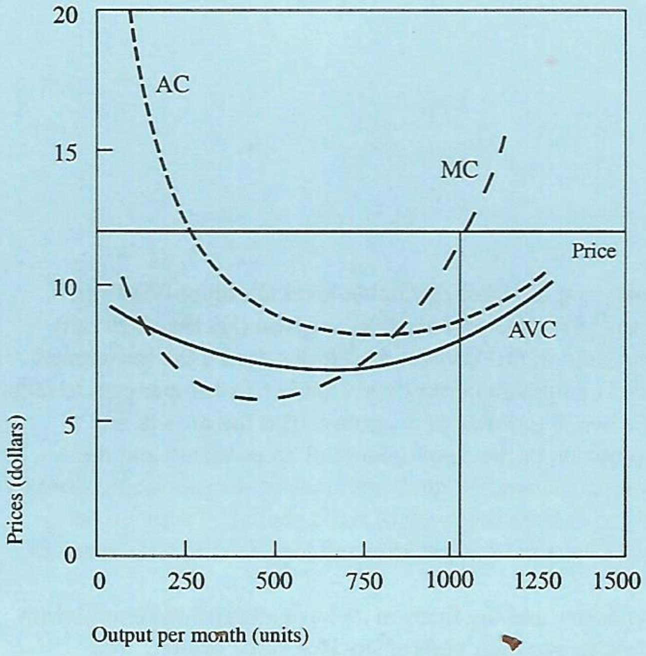
Suppose that an industry and the firms in its have attained the equilibrium price and output relative to their current stock of fixed capital. The situation of a typical firm might be as shown in Figure 3–3. The figure shows the average- and marginal-cost curves, the current price, and the average variable-cost curve, labelled *AVC*. The last is a new concept, but obvious. Average variable costs are variable costs per unit of output, or variable cost divided by output.

Clearly the industry is prospering. This is shown by the fact that the price is well above average cost at the most profitable level of output (1050 units, where marginal cost equals price). At that level of output average costs are substantially above their lowest level, and so are average variable costs. This indicates that the current plant is too small to produce the profitable rate of output without incurring some costs due to congestion and overloading. The obvious way to avoid the costs and headaches of an overworked plant is to enlarge it. The stage is set for deciding whether to enlarge the plant and, if so, how much.

The decision is reached by balancing the favourable and unfavourable effects of plant enlargement. The favourable effects are to reduce the bottlenecks, crowding, and general overworking of the plant, which will be reflected diagrammatically in a reduction in average variable costs. How much these costs are reduced depends on how much the plant is enlarged. At the extreme, which is not likely to prove economical, it appears from the graph that they could be reduced to as little as $6.75 a unit. This would save about $1.15 a unit, amounting to $14 500 a year.

The unfavourable effects can be regarded in either of two ways which, correctly analysed, should lead to the same decision. Basically, plant expansion costs money. In the first place, there is the capital cost of building the plant and buying the equipment. After that, there is a continuing flow of fixed expenditures for property taxes, insurance, and the like. We shall refer to this continuing flow as the associated fixed costs.

Figure 3–3: Short-run equilibrium of the firm. Marginal cost equals price, but average cost can be lower.



So far, we have that if the firm enlarges its plant it will realise an annual *saving* equal to the reduction in variable costs minus the associated fixed costs, but also it will have to pay for this saving by incurring the capital cost at the time of the expansion. Now we are up against the fundamental question of investment decisions: Is the saving large enough to justify the capital cost? Is, for example, a prospect of saving $12 000 a year big enough to warrant an investment of $36 000? The essence of the question is how to compare an expenditure that would have to be incurred now with savings that will accrue over a long period, perhaps 15 years.

There are, as we have said, two ways in which this can be done. One is to convert the anticipated flow of savings into a single sum of money that represents how much that flow is worth to the company, that is, how much it would be willing to pay to obtain those savings. This sum is called the 'present value' of the savings and can be compared directly with the capital cost. The alternative is to convert that capital cost into an annual flow that can be compared directly with the savings. The two approaches, of course, lead to the same decision in the same circumstances.

For example, if a company car is to be worth purchasing, the company must anticipate that it will earn sufficient gross revenues to cover the variable costs of operation, plus the associated fixed costs, plus interest on the investment, plus the depreciation. Otherwise the company would be better off without the car. Thus, the relevant comparison to be made is the revenues net of variable costs on the one hand, with the sum of associated fixed costs, interest, and depreciation on the other.

Now we have provided an implementable definition for fixed cost. It is the sum of associated fixed costs, interest on the value of the investment, and depreciation expenses. This sum can be compared with the annual savings or earnings of an investment to determine whether it is worth undertaking.

We have propounded a simple rule for making investment decisions. It is: First, estimate the annual earnings (after allowance for variable costs) or savings that would result from the proposed investment. Second, estimate the increase in annual fixed costs that would be caused by it, as the sum of its associated fixed costs, interest cost, and depreciation charges. Then the investment is advisable if the annual earnings or savings exceed the increase in fixed costs; otherwise not. Notice that the decision depends only on the annual earnings and the fixed costs. The initial capital outlay influences the fixed cost but does not enter the comparison directly.

This rule, of course, is deceptively simple. It is often very difficult to make the estimates. The future earnings and resale values cannot be foretold with accuracy or certainty. Even the appropriate interest rate is sometimes difficult to estimate. So the rule provides a framework for analysis rather than a definite formula ready for mechanical application. It organises the considerations rather than solves the problem, and a good deal of sophisticated economic, business judgement, and investment analysis is likely to be required to apply it in any practical instance. But it will suffice for our expository purposes.

Source: R. Dorfman & N. Norman, *Prices and Markets in Australia: Theory and Applications,* Prentice Hall, Melbourne, 1980, pp. 46–9.

Ball-point pens

Reading 8.3

R.G. Lipsey

… In 1945, Milton Reynolds acquired a patent on a new type of pen that used a ball bearing in place of a conventional point; he formed the Reynolds International Pen Company, capitalized at $26,000 and began production on 6 October 1945.

The Reynolds pen was first introduced with a good deal of fanfare by the New York department store, Gimbels, who guaranteed that the pen would write for two years without refilling. The price was set at $12.50 (the maximum price allowed by the wartime Office of Price Administration which was the body with which the American central authorities sought to control prices during and after the Second World War). Gimbels sold 10,000 pens on 29 October 1945, the first day they were on sale. In the early stages of production, the cost of production was estimated to be around 80¢ per pen.

The Reynolds International Pen Company quickly expanded production. By early 1946, it employed more than 800 people in its factory and was producing 30,000 pens per day. By March 1946 it had $3 million in the bank. Demand was intense. Macy's, Gimbel's traditional department-store rival, introduced an imported ball-point pen from South America. Its price was $19.98 (production costs unknown).

The heavy sales quickly elicited a response from other pen manufacturers. Eversharp introduced its first model in April, at $15.00. In July 1946, the business magazine, *Fortune,* reported that Schaeffer was planning to put out a pen at $15.00, and Eversharp announced its plans to produce a 'retractable' model priced at $25.00. Reynolds introduced a new model, but kept the price at $12.50. Costs were estimated at 60¢ per pen.

The first signs of trouble emerged. The Ball-point Pen Company of Hollywood (disregarding a patent infringement suit) put a $9.95 model on the market, and a manufacturer named David Kahn announced plans to introduce a pen selling for less than $3.00. *Fortune* reported fear of an impending price war in view of the growing number of manufacturers and the low cost of production. In October, Reynolds introduced a new model, priced at $3.85, the cost about 30¢ to produce.

By Christmas, 1946, approximately 100 manufacturers were in production, some of them selling pens for as little as $2.98. By February 1947, Gimbels was selling a ball-point pen made by the Continental Pen Company for 98¢. Reynolds introduced a new model priced to sell at

$1.69, but Gimbels sold it for 88¢ in a price war with Macy's. Reynolds felt betrayed by Gimbels. Reynolds introduced a new model listed at 98¢. By this time ball-point pens had become economy items rather than luxury items, but still were highly profitable.

In mid-1948, ball-point pens were selling for as little as 39¢, and costing about 10¢ to produce. In 1951, prices of 25¢ were common. In 1970, there was a wide variety of models and prices, ranging from 10¢ to $5.95, and the market appeared stable, orderly, and only moderately profitable. Ball-point pens were no passing fad, as every reader of this book knows. Their introduction has fundamentally changed the writing-implement industry in America and in the world.

The ball-point pen example has interested observers in many fields. Lawyers have been concerned about the ease with which patent rights were circumvented. Psychologists have noted the enormous appeal of a new product even at prices that seemed very high. Advertising men have regarded it as a classic case of clever promotion.

From the point of view of economic theory, it illustrates several things:

(1) That a monopoly (in this case a patent monopoly) can in the short run change prices not remotely related to costs and earn enormous profits.

(2) That entry of new firms (even in the face of obstacle) will often occur in response to high profits.

(3) That where it does occur, entry will in time drive prices down to a level more nearly equal to the costs of production and distribution.

(4) That the lag between an original monopoly and its subsequent erosion by entry may nevertheless be long enough that the profits to the innovator, as well as to some of the imitators, may be very large indeed. (It is estimated that Reynolds earned profits as high as $500,000 *in a single month* — or about 20 time its original investment.)

Source: R.G. Lipsey, *Positive Economics,* 3rd edn, Weidenfeld & Nicholson, London, 1971, pp. 306–7.

Imperfect competition

Topic 9

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Suggested answers

Reading 9.1

Introduction

In Topic 8 we compared the pure monopoly market form with that of perfect competition. We saw that these were extreme forms in markets. Their value is mainly as limiting cases highlighting the implications of market power and barriers to entry.

We now turn our attention to models and theories developed in an attempt to explain market situations where competition exists but only in an imperfect form—i.e. markets that lie somewhere between the extremes of monopoly and perfect competition. There are many different types of imperfect markets, and many models have been developed to aid the understanding of them. We look briefly at *monopolistic competition* but we devote most of our time to the analysis of *oligopolies*.

In analysing monopolistic competition we are highlighting the impact of strategies based on *market segmentation and product differentiation*, while the focus of our study of oligopolies is the importance of the *strategic interaction* between firms. Interaction between firms, be it in the form of rivalry or collusion, adds an interesting and crucial dimension to the study of firm-level decision making. We will consider why collusion is attractive to firms in some cases but legislated against by governments. We will also introduce the approach of game theory as a device to aid decision making in the complex and uncertain world of strategic rivalry.

Objectives

At the end of this topic you should be able to:

- explain the nature of imperfect competition;
- analyse the monopolistic competition case and discuss the role of product differentiation;
- describe the important structural elements of an oligopoly;
- demonstrate how the kinked demand curve model may be used to explain price uniformity under some conditions of imperfect competition;
- analyse collusive oligopoly in terms of models of collusive behaviour, and game theory;
- outline various strategies of non-price competition, or rivalry, exhibited in an oligopoly;
- assess the performance of oligopoly in terms of allocative and technical efficiency; and,
- explain the fundamentals of game theory in the context of oligopolistic behaviour.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, Chapter 10.

Reading

Reading 9.1
D. McTaggart et al.
'Models of oligopoly'

Imperfect competition and market structure

A major distinguishing feature of imperfect competition is the reduced importance attached to price as a key variable in decision making. Here it is no longer a simple matter of setting the price that will keep the firm in business, or that will achieve maximum profit, or some other desired monopoly profit. Many other factors could be important, and this greatly increases the degree of uncertainty that decision makers face.

Firms, whether efficient or inefficient, face a surrounding environment of uncertainty and will seek to reduce this uncertainty over time. If consumer demand is uncertain, an attempt may be made to reduce uncertainty by creating demand through marketing procedures, e.g. by intensive advertising. If supply is unstable or outlets unfavourable, then the associated uncertainty may be reduced by mergers, e.g. by backward or forward integration.

These and other measures have long been features of the market system. Some of them will be considered in this and later topics.

The outcome of these measures in many industries has been a change from a large number of small firms to a small number of large firms. Such a change brings with it mutual interdependence among the survivors, and an awareness that price competition may erode either profits or market shares, or both. Firms in this situation are quite different from those in perfect competition or pure monopoly. Competition between them moves away from price areas into non-price areas such as cost-cutting, advertising and research.

☐ *Read Begg et al. (2000), pp. 149–52 (up to Section 10-2).*

Question 9.1

According to Begg et al. (2000) what conditions move an industry towards the following structures:

- ***an oligopoly***
- ***monopolistic competition?***

Monopolistic competition

Imperfect competition need not only occur when the numbers of firms are few. In industries where there are large numbers of firms, individual firms may exert some monopoly power in their market. This market power can come from differentiating the firm's product from other products in related markets.

Characteristics of the monopolistic model

Monopolistic competition can be analysed with the aid of the structure-conduct-performance framework.

In terms of structure:

- There are a large number of firms.
- There are a large number of buyers.
- The firms sell a slightly differentiated product.
- New firms are free to enter the industry should they perceive the possibility of abnormal profits.

In terms of conduct:

- Profit maximisation represents an approximation of the firm's goal.
- Collusion is largely precluded by the large number of firms in the industry.
- Coercion of rivals is not possible, because of the large numbers.
- The main decision variables for the firm are price and output, and sales expenditure (both advertising and sales service).
- Easy entry results in only normal profit being earned in the long run, and price and output are set accordingly.
- Sales expenditure directed towards increasing demand for the products of the particular firm may be important.

In terms of performance:

- Normal profits indicate allocative efficiency.
- The negatively sloped demand curve means that in the long run there is less than maximum productive efficiency.

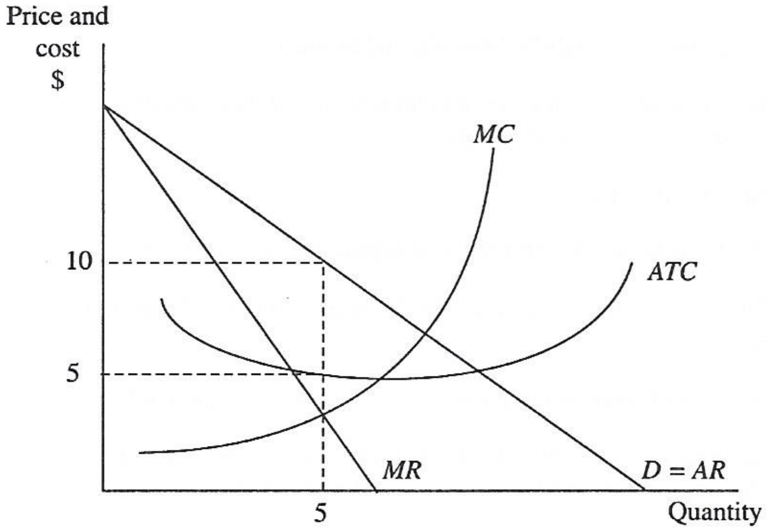
It is possible to identify several close approximations to monopolistic competition in Australia. Tisdell (1974, p. 257) suggests trucking business, garden nurseries, manufacturers of plastic mouldings and shoe stores as good examples.

The differentiated nature of the products offered is a key characteristic of the monopolistic competition model. Sometimes the differentiation may be in the physical product itself, or in the service provided or the location of the business. Quite often the difference may be in terms of the image of the total product created in the consumers' mind. The importance firms place on this process of differentiation is evidenced in much of the promotional effort of consumer product firms.

Price and output decisions under monopolistic competition

When analysing the price and output decisions of the firm in the monopolistically competitive model it is necessary to distinguish clearly between the short and long-run situations. Like the firm in perfect competition, the monopolistically competitive firm may make economic profits in the short run but not the long run. In the short run the firm will determine price and output in a similar fashion to a monopoly. This is illustrated in Figure 9.1.

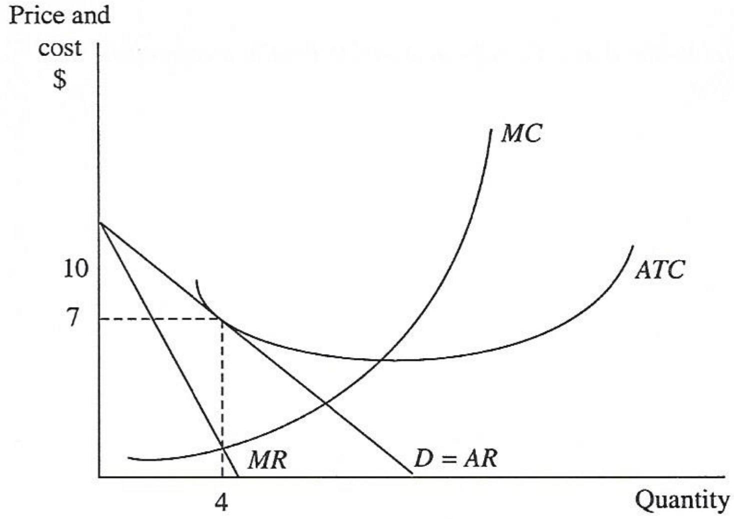
Figure 9.1: **Profit maximisation in the short run in monopolistic competition**



The firm operates at the point where $MC = MR$ and produces 5 units of output. The price received is $10 and the cost of production is $5 per unit. The economic profit at this point is $25 (*TR* is 5 x $10 or $50 and *TC* is 5 x $5 or $25).

However, in the long run these profits are not sustainable because the model assumes no barriers to entry or exit beyond the short run. With insignificant barriers to entry and exit, new firms will enter this market. As this happens the incumbent firm's demand curve will shift to the left and or the cost curves will rise. This process will continue until all economic profits are competed away. This long outcome is illustrated in Figure 9.2.

Figure 9.2: Profit maximisation in the long run in monopolistic competition



Our firm is now left selling a smaller quantity (4) at a lower price ($7) with no greater than normal profits. In addition, it is clear from the diagram that although the firm makes normal profits in the long run it does not operate at its minimum average cost. This condition is commonly referred to as excess capacity in that the firm could reduce its average cost if demand was to expand.

Product innovation is a potentially positive aspect of monopolistic competition. Under the sort of conditions assumed under monopolistic competition, firms are motivated to continually seek new points of innovation that offer the potential for short-run economic profits. The fact that these innovations are only profitable if consumers are prepared to pay for them suggests gains to consumers. Of course this last point is subject to some debate, especially as it relates to image and advertising.

Advertising is, at least in part, an attempt to influence consumers' perception of a product. If advertising conveys valuable and accurate information it will enable consumers to make more welfare enhancing selections between products. But there is much debate about what constitutes valuable information.

The critical difference between the monopolistically competitive model and the model of perfect competition is the element of market power in the former. An analysis of the expected outcomes from the two models effectively provides a proof of the impact of market power on decision making. This contrast shows that the presence of market power tends to result in lower production levels and higher prices.

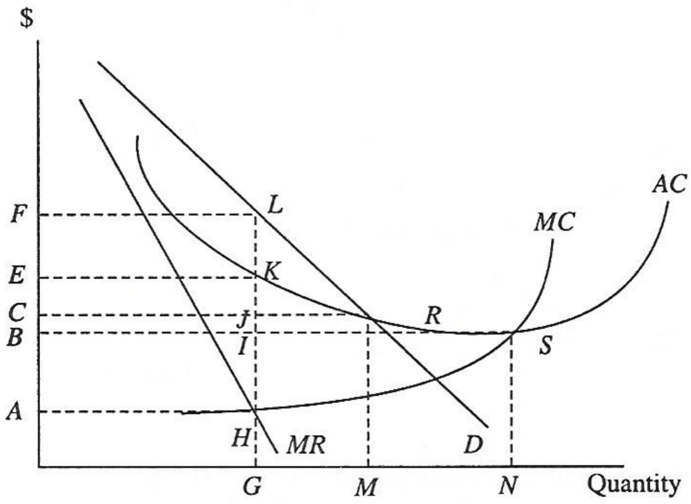
Similarly, we can identify one critical analytical point of difference between the monopolistically competitive firm and the pure monopoly—the latter has sustainable barriers to entry. The contrast of these two models shows that the presence of barriers to entry provides the potential for long-run super-normal profits.

☐ *Read Section 10-2 in Begg et al. (2000), pp. 152–4, for a review of monopolistic competition.*

What seems the key characteristic of a monopolistically competitive market?

Question 9.2

The figure below shows a profit-maximising firm in monopolistic competition.



(a) How much output will be produced by the firm?

(b) At what price will the output be sold?

(c) Will the firm make supernormal profits in this situation? if so, identify the extent of supernormal profits.

(d) Would you consider this to be a long -run or short run equilibrium for the firm?

(e) Explain your answer to (d) and describe how the situation might differ in the 'other run'.

Question 9.3

The market for eyeglasses in large cities has many of the characteristics of monopolistic competition, there being a large number of sellers of eyeglasses, each one's product being slightly different from the others. Some states in the USA have banned advertising of prices by sellers of eyeglasses. The following table shows the average price of eyeglasses in these states, as well as in states with no advertising restrictions:

	Average price	
Nature of state law	*Eyeglasses*	*Eyeglasses and examinations*
Ban on advertising	***$33.04***	***$40.96***
No ban on advertising	***$26.34***	***$37.10***

(a) Since advertising is a selling expense which requires the use of resources, it is reasonable to expect that a firm's costs would be lower if it didn't advertise?

(b) If advertising increases costs, why did the price of eyeglasses tend to be lower in states with no ban on advertising?

(c) In 1978, the federal regulators declared restrictions on eyeglass advertising to be illegal. Why do you think they took this action?

Source: Mansfield (1994), p. 398.

Question 9.4

Does the absence of barriers to entry imply that there are no sunk costs?

Oligopoly

While the essence of the monopolistically competitive model is product differentiation, the key point to concentrate on in the study of oligopolistic models is the issue of interdependence in decision making.

Once again, we will use the structure–conduct–performance framework to analyse an oligopoly.

Oligopoly structure

The important elements of oligopoly structure are:

- There are few sellers.
- There are few or many buyers. In the case of a few buyers, countervailing power may exist and a situation more akin to bilateral monopoly may result. Where buyers are few, it is often the case that they purchase items for use in other productive processes rather than for final consumption. Purchasing is often done by specialists interested mainly in value-for-money rather than in superficial product differentiation. Where buyers are many, the individuals have less market power.
- Most products are *differentiated*. Product differentiation has the effect of giving the oligopolist more monopoly power. A great deal of activity is therefore directed towards competitive advertising and superficial product variation to achieve this end. If this is successful, the individual firm may feel more confident about the constancy of its market and worry less about the actions of its rivals. On the other hand, oligopolists producing undifferentiated products—for example, a specific grade of steel in the United States—may have a stronger incentive to collude, either implicitly or explicitly.
- Barriers to entry are high.
- There is likely to be a high proportion of fixed to variable costs.
- Vertical and horizontal integration are probable.

In the mid-1970s, Round identified the following factors that have tended to move Australian markets towards an oligopolistic model (Round 1976a, pp. 98–9):

- the relatively small size of Australian markets and the need for firms to be large in order to achieve economies of scale;
- the protection afforded by geographic isolation and the tariff policies of the Australian government;
- the wide-scale presence of overseas-owned firms with absolute cost advantages and access to financial capital;
- product differentiation within initially small markets and the subsequent growth of firms as the market has grown;

- the large number of important regional markets in Australia, where opportunities exist for concentrated markets in products generally perishable, bulky and difficult or expensive to transport;
- the absence, until the seventies, of any effective anti-trust policy, which encouraged the profit motives of merger and restrictive competition.

Although this list was compiled 30 years ago, little has changed—perhaps with the exception of recent trends in anti-trust policy and the general reduction in tariffs that has occurred since the early 1980s.

Oligopoly occurs when the number of sellers in a market is so small (usually between two and twenty enterprises), that their actions have a significant impact upon each other, thus making their decisions *interdependent*. As oligopolistic firms act and react to each other, it is usually extremely difficult to determine what the response of rivals will be to a particular piece or commodity change. No generally applicable behavioural assumption can be used. The interrelationship of the decisions of firms in an industry may often result in uncertainty about the response to a firm's action. This may lead to moves to co-ordinate the decisions of the industry to reduce uncertainty.

In this discussion, a firm may be either an individual production unit (such as a plant or factory) or a number of separate production units under common control and ownership. An industry, on the other hand, is understood to be a group of firms whose products are sufficiently similar to be close substitutes or which use similar processes of production, raw materials, or channels of distribution.

Conduct: Models of oligopoly

Many economic models have been generated in an attempt to explain oligopolistic behaviour. The argument here is that oligopolistic market structures encourage *collusion* among firms in an endeavour to reduce market uncertainty.

☐ *As background to the discussion, read Begg et al. (2000), pp. 154–5 (up to 'Cartels').*

What lies behind Begg et al.'s assertion that 'oligopolies are torn between the desire to collude ... and the desire to compete' (p. 155)?

To support the collusion theory selected representative models are presented, beginning with those models that assume that firms make independent decisions and do not collude. This is then followed by a consideration of co-operative or collusive models of oligopoly.

However, oligopolies may still show non-price competition, or rivalry, and this sub-section ends with a discussion of this form of conduct.

Non-collusive oligopoly

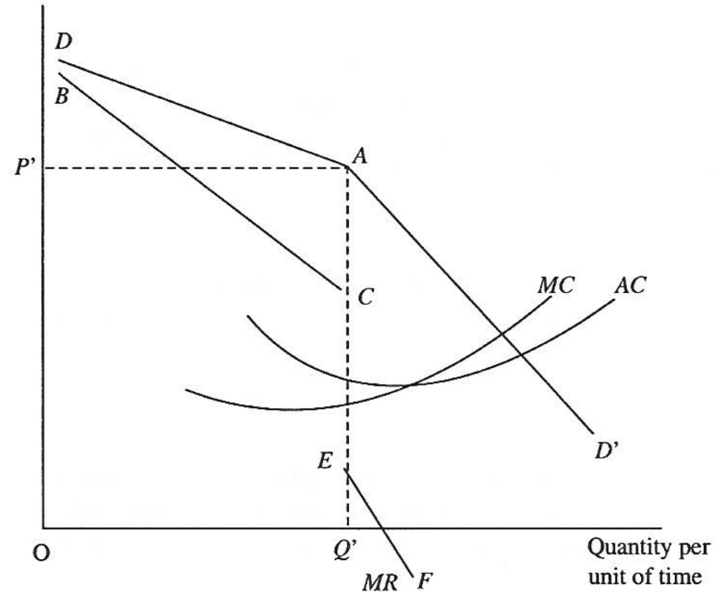
Each of the models in this group makes different assumptions about the behaviour of firms. As a result, the same basic market structure can result in different market conduct depending on the assumptions. The assumptions are simple and the results of limited application to real situations. There is no need for detailed analysis of structure, conduct and performance.

These models are abstract and you may find them quite difficult. With the exception of the *kinked demand curve model,* you are not required to reproduce or master them. They are discussed very briefly now. If you wish to study them more deeply, you will find them mentioned in most microeconomics texts.

- *Naive models:* Some of the earliest oligopoly models fall into this class. They include the models of A. Cournot (1838), J. Bertrand (1883) and F. Edgeworth (1897). These models are naive in that they assume that firms never learn about their rivals' behaviour (or vice-versa) from previous market experiences. The firm continues to take action based on fixed assumptions about rivals' behaviour. Such action continues to lead to a market situation which is less than the joint (industry) maximum profit position. These models assume one-off interactions.
- *Chamberlain's model:* Firms recognise their interdependence through experience. In this way a stable equilibrium position is reached within the industry as a whole.
- *Kinked demand curve:* This model was suggested by Sweezy to explain price rigidity over time, which has often been observed to apply in oligopolistic markets. It is based on the assumption that if a firm raises its price for a commodity, rivals will not change their prices, but if it cuts its price, rivals will meet the reduction. This means that the demand curve facing a firm will be more elastic (flat) for price increases than for price decreases, i.e. it will have a 'kink' at the current price and output level.

This kinked demand curve model is illustrated in Figure 9.3.

Figure 9.3: Kinked demand curve model



Note how the demand curve *DAD'* implies a marginal revenue curve which consists of three distinct parts—a section *BC* which corresponds to the upper part of the kinked demand curve, a section *EF* which corresponds to the lower part of the kinked demand curve, and a discontinuous section *CE*.

☐ *Read 'The oligopoly kinked demand curve' in Begg et al. (2000), pp. 155–6, for a discussion of the kinked demand curve model.*

To maximise profit a firm will produce *Q'* at price *P'*.

Collusive oligopoly

A collusive oligopoly may develop when firms perceive an advantage from joint action. This advantage could take many forms including higher profits, more stable market shares or reduced risk.

Oligopolist *conduct* has several important features:

- Collusive behaviour exists. It can be implicit or explicit.
    - One example of implicit collusive behaviour is the use of the cost-plus method of pricing. In this case oligopolists do not get together to co-ordinate pricing policy; they simply observe the practice of adding a mark-up to unit costs. As cost rise, prizes will also rise in an orderly manner that ensures that the relativity of prices charged by different firms is maintained.
    - Oligopolists may collude explicitly in a number of ways. Markets may be shared and there is a wide range of possible pricing policies. One example of this type of collusion, the cartel, is discussed below.
- Coercion is likely in the establishment or maintenance of an oligopoly. This usually takes the form of a threat—either actual or implied—of 'disciplinary behaviour'. Large firms may never directly coerce their rivals but the possibility may be all that is needed to keep them in line.
- Policy with respect to price is of crucial importance in the evolution and maintenance of a stable oligopoly. Agreement on the setting of prices can be thought of as establishing the ground rules for the product of rivalry between oligopolists for sales.

Cartels

Cartels are an extreme form of oligopolistic organisation. They are formal organisations whose rules preclude much scope either for competition or for rivalry.

There are three main types.

- *Joint-profit-maximising cartels:* A group of firms appoints a control agency to make the decisions regarding market shares, prices and profit distribution that are necessary to maximise joint profit among the participant members.
- *Market-sharing cartels:* Here firms agree to share a market but retain freedom concerning the style of their output, selling activities and other decisions.

- *Joint-revenue-maximising cartels:* For various reasons firms may wish to maximise total sales or revenue. This might be determined by individual members endeavouring to enlarge or maintain their market shares.

Some well-known examples of international cartels are the Organisation of Petroleum Exporting Countries (OPEC) and the International Bauxite Association. On a national scale the following two examples are of interest.

- The Tasmanian Royal Commission into Prohibitive Trade Practice (1964) found that wholesale wine and spirits merchants had restricted their trade to northern or southern territories within the State, and that the Australian plywood distributors appeared to confine their sales only to the State or States in which they operated.
- More recently, the ACCC successfully brought an action against a group of car windscreen suppliers for maintaining collusive marketing arrangements.

Cartel agreements are inherently unstable, for they provide the individual participant firm with the opportunity to increase total sales revenue by secretly undercutting the cartel price.

☐ *Read 'Cartels' in Begg et al. (2000), p. 155.*

Question 9.5

Assume that the electric light bulb industry comprises three manufacturers. These firms form a joint-profit-maximising cartel. The marginal cost functions for the three firms and the estimated industry demand are as follows:

Hourly output and sales in cartons	***Marginal costs***			***Price of cartons of light globes***
	Firm 1 $	***Firm 2 $***	***Firm 3 $***	***$***
0				
	28	***30***	***20***	
1				***95***
	40	***36***	***24***	
2				***90***
	54	***46***	***32***	
3				***86***
	capacity	***capacity***	***capacity***	
4				***82***
5				***78***
6				***74***
7				***70***
8				***67***
9				***64***

(a) Determine the most profitable price and hourly output for the industry. Assume that each additional unit is produced at the plant with the lowest marginal cost for that unit.

(b) Determine the optimal allocation of hourly output among the three firms.

Oligopolistic rivalry

Policy with respect to variables other than price may be of overriding importance in the case of the oligopoly form. This is the crucial difference between oligopoly and the other market forms already discussed. Non-price competition or rivalry merits detailed examination before our attention is directed to the *performance* of oligopoly.

There is a tendency for oligopolistic interaction to concentrate on non-price variables for two reasons:

- Price cuts, to attract business from rivals, compel competitors in self-defence to match the lower price with no gain to any of the firms involved.

- A price-cutting strategy is quickly and easily imitated by another firm (unless cost-saving technologies are the basis for price cutting).

Thus the most attractive strategies for increasing a firm's sales–profit and market share–may often be non-price strategies. It is these non-profit strategies that are the basis of market rivalry. This is not to say that pricing decisions are unimportant. Whenever market power exists, firms confront important decisions on how to price their products.

Thompson (1977, pp. 453–4) provides a useful summary of the non-price strategies open to the firm. An abbreviated version of this table is reproduced here as Table 9.1.

Table 9.1: Major forms of market rivalry

1 *Strategies for strengthening market share*

  - Attempt to increase the use of present products in present markets, e.g. increase current buyers' usage of the product through inbuilt obsolescence.

  - Move to open up new markets for existing products, e.g. broaden the product's appeal by advertising in other types of media.

  - Develop new products for present markets, e.g. add new models and sizes.

2 *Integration strategies*

  - Vertical integration, e.g. backwards towards suppliers and forwards to distribution.

  - Horizontal integration, e.g. acquire a rival's business.

  - Concentric diversification, e.g. enter into new fields that are related to the firm's present business in terms of customer base, technology, or channels of distribution.

3 *Conglomerate diversification strategies*

  - Enter into field unrelated to the firm's present business, e.g. merger with a profitable company with a countercyclical or counterseasonal sales pattern, to smooth out sales and profit fluctuations.

What examples of market rivalry strategies have you seen in your industry? List them under the classifications in Table 9.1.

Petersen and Lewis (1994), Chapter 12, provides a useful overview of firm level pricing strategies for students with a special interest in this area.

We now turn from the *conduct* of oligopoly to the performance of oligopoly.

Performance of oligopoly

The most important things to note in any assessment of the performance of oligopoly is that we are not dealing with a single model. This was the case with pure competition, pure monopoly, and, to a large extent, monopolistic competition, Oligopoly, on the other hand, takes many different forms. As we have seen, there are many possible combinations of structure and conduct. These can have favourable and unfavourable effects on the performance of oligopoly. Judgements concerning oligopoly need to be made in relation to particular real oligopoly situations.

It is with this sort of qualification in mind that we look at what has been said by way of generalisation about some areas of the performance of oligopoly—allocative efficiency and technical efficiency.

Allocative efficiency

With regard to allocative efficiency, our concern is with the extent to which the existence of oligopoly produces the wrong mix of products. This would be indicated by prices that are in excess of marginal costs and the existence of abnormal profits.

There are several factors which influence oligopolists to keep prices from rising too far from marginal costs. They include things such as:

- import competition;
- legal constraints;
- the growth of markets, sometimes brought about through technological innovation (note recent changes in the computer industry);
- competition from government enterprises, as in the banking sector;
- the threat of union action;
- the fear of adverse public image in large firms if monopoly-type strategies are followed.

Technical efficiency

With respect to technical or productive efficiency, concern is with the extent to which more resources than are necessary are used in producing and marketing products.

- A key area of production inefficiency in oligopolies is the so-called 'X-inefficiency'—a term first coined by the Harvard economist Harvey Leibenstein. It refers particularly to a lack of motivational efficiency either by labour or management or both within a firm.

Other types of productive inefficiency which occur in the oligopolies include:

- abnormally high excess capacity of plant;
- continued use of obsolete plant and equipment; and
- inappropriate allocation by management of labour skills within a firm, e.g. allocating a highly trained nurse to schedule operating theatre activity within a major private hospital.

In the first edition of his book on industrial structure, Scherer (1980) argued that productive inefficiency may often amount to 10 per cent of costs in US manufacturing. In Australia, productive inefficiency may be the explanation for the fact that many highly concentrated industries earn relatively low profits. These industries have high prices and high costs and thus earn low profits.

From your experience in working in, or dealing with, industries with oligopolistic characteristics, would you say that the achievement of market power and the associated rivalry between firms has made the industry more or less efficient. Why?

Game theory

In 1944, J. von Neumann and O. Morgenstern published the first systematic attempt to apply mathematical games theory to oligopolistic behaviour. Firms in oligopolistic markets are like players in a chess game; to each move by one player the other may choose among several counter-moves. In the case of the kinked demand curve, the strategy is one of pessimism. Each firm assumes that its rivals, acting independently, will take those actions least favourable to it. Possible strategies and outcomes are indicated on a payoff matrix. The simplest model is a duopoly market zero-sum game, in which each firm attempts to maximise its performance (e.g. market share) at the expense of the other. That is, the sum of net gains is zero. An equilibrium solution is reached if a payoff is preferred by both firms simultaneously.

☐ *Read Section 10-4 in Begg et al. (2000), pp. 156–8, for a good summary of this analytical approach.*

The theoretical analysis can be made more realistic by the inclusion of:

- more than two firms;
- uncertainty (probability) as to likely payoffs;
- non-zero sum solutions.

Game theory does not provide a general theory of oligopoly behaviour. Nevertheless, it clearly indicates the interdependence of firms and the strong incentives for collusion to reduce uncertainty, particularly under variable sum conditions. Moreover it provides a very useful analytical framework for evaluating a wide range of real world problems.

Students who are interested in looking in more detail at game theory should read Chapter 13 of Mansfield (1994) listed under 'Further

Readings' for this topic. Mansfield provides numerous examples of how this approach can clarify difficult choices faced by firms.

☐ *Now complete Reading 9.1 which gives you an historical perspective on the development of game theory and the central contribution of von Neuman to that theory.*

The analysis of real markets

Few, if any, industries can be easily categorised into the four market structures we have outlined in this and the preceding topic. For example, most industries have some barriers to entry and information available to managers is nearly always less than perfect. On the other hand, barriers to entry are rarely absolute and substitutes are generally present. These factors clearly pose a problem for economic analysis. In reality, there is a wide range of market forms and different principles of market behaviour. When examining the operation of markets it may be a mistake to try to classify *all* cases into one of the four market structures. It probably is more important to concentrate on identifying the key strategic indicators in a market:

- the extent of market power;
- the nature and extent of barriers to entry; and,
- the nature of strategic interactions between firms.

The problem for economic analysis is to provide a framework for the organisation of knowledge in the area and for the development and appraisal of models to aid in the systematic understanding of actual situations. A useful framework for analysing the operation of real markets is presented in the appendix to this topic.

In the appendix to this topic we consider the *structure-conduct-performance framework* which provides a basis for the organisation of knowledge of the real world. More importantly, it also provides the basis for hypotheses about the causal connections between structure, conduct and performance. Market structure can determine market conduct, which in turn may result in a particular market performance. You will also have noted the possibility of market conduct influencing market structure, performance influencing conduct, and so on.

Some students may find the appendix particularly useful when tackling the case study part of the unit assessment. The structure-conduct-performance framework developed in this appendix can be used to analyse the link between the competitive conditions operating in an industry, the way firms behave and the implications of this behaviour for the efficiency with which resources are used in the industry.

While the material covered in this appendix will not be assessed in the exam for this unit, all students will benefit from reading it.

Summary

The monopolistically competitive model focuses attention on the implications of market power in the absence of barriers to entry. We saw that firms have an incentive to create local market power through product differentiation and promotion. The returns from these strategies are enhanced short-run profits. In the long run, the absence of barriers to entry means these profits are vulnerable to competition from other firms.

The study of oligopolistic models highlights the impact that interdependence in decision making has on the actions of firms. Strategic interaction between firms occurs in numerous forms and can have a multiplicity of outcomes. While there are no single, simple models that are universally applicable to the study of oligopolistic behaviour, the game theory approach provides a useful analytical perspective.

This topic and Topic 8 have raised a number of issues relevant to industry policy. Examples of these issues include the potential of firms to develop and exploit market power and the incentive firms have to invest in research and development. The policy implications of these and other related policy issues are taken up in topics 10 and 11.

Review questions

Review question 9.1

(a) What do we mean by 'interdependence in decision making'?

(b) How do we expect interdependence in decision making to impact on firm level decision making?

Review question 9.2

(a) Draw kinked demand curves to show that the profit-maximising price can remain constant in spite of change in:

(i) production costs

(ii) consumer demand

(b) Consider the assumptions underlying the kinked demand curve model. How valid is this model of oligopoly in today's economic environment?

Review question 9.3

Which of the following characteristics are typical of an industry operating under monopolistic competition in the long run?

(a) Individual firms in the industry make only small monopoly profits.

(b) Individual firms in the industry would be keen to sell more output at the existing market price.

(c) There is product differentiation.

(d) Each firm faces a downward-sloping demand curve.

(e) Firms operate below full capacity.

(f) Firms maximise profits where marginal cost equals marginal revenue.

(g) There is collusion among firms in the industry.

(h) The profits accruing to firms are just sufficient to cover the opportunity cost of capital employed.

Review question 9.4

What are the more common strategies used by firms in an oligopoly to increase sales? Why are they preferred?

Review question 9.5

Compare and contrast monopolistically competitive firms with oligopolistic firms in terms of allocative efficiency, and technical efficiency.

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Appendix: The structure–conduct–performance framework

The structure–conduct–performance (S–C–P) framework for the analysis of markets or industries has been developed and extended since its conception more than forty years ago. In the most simple form of the framework it is assumed that there is a unidirectional causal relationship between the structure of a market and the conduct and hence the performance of firms that operate in that market, i.e. structure determines conduct which in turn determines performance. This is the approach we take in this appendix.

Table A9.1 lists structure and conduct elements and performance criteria that may be considered in this analytical framework.

Table A9.1: The structure–conduct–performance framework

Structure	Conduct	Performance
Seller concentration	Pricing and output policies	Allocative efficiency
Product differentiation	Advertising	Productive efficiency
Barriers to entry	Product quality	Industry efficiency
Buyers concentration	Product variety	Distributive efficiency
Cost structure	Research and development effort	Advertising expenditure to sales ratio
Diversification		Price stability
Vertical integration		Social costs and benefits
Horizontal integration		
Conglomerate integration		

Note that:

- *Market structure* refers to the market environment features that influence the relationship between buyers and sellers in a market.
- *Market conduct* refers to the behaviour and goals of the participants in the market.
- *Market performance* refers to the economic appraisal of the results of activity in the market by firms or industries. The aim here is to assess actual performance against potential performance from the viewpoint of society.

We will now briefly consider the various components of the framework listed in Table A9.1.

Structure

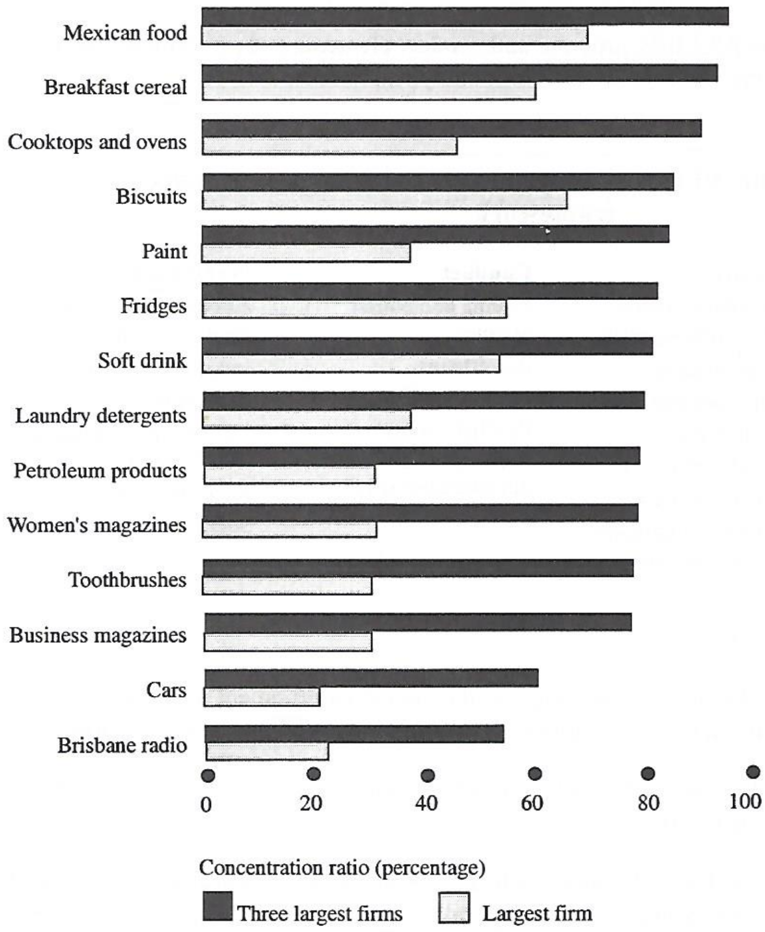
Seller concentration

Seller concentration refers to the number of sellers, and, where this is relevant, to the proportion of the market held by, say, the largest four, eight or twenty firms. The concept is unambiguous in the cases of pure competition and pure monopoly, as you have seen. But in the case of oligopoly (few sellers) there is a good deal of difference between the case where eight firms divide the market equally between them, and the case of eight firms where two firms account for 80 per cent of the market.

The extent to which imports are present may also affect the real degree of concentration.

The number and degree of concentration of sellers is an empirical question and there are studies of this for most countries. Table A9.2 contains a sample of concentration data for Australia. Several conclusions can be derived from the examination of empirical studies.

Table A9.2: Concentration of selected Australian industries



Measured by the three-firm concentration ratio, this sample of industries reveals relatively high concentration ratios at the three-firm level. Many of these industries are also associated with well-known brand names and extensive advertising. The largest firm in the industry also tends to have a relatively large market share.

Source: McTaggart et al. (1996), p. 298.

Concentration patterns are:

- quite similar for different industrial capitalist countries;
- fairly stable over time;
- influenced by such things as economies of large scale, barriers to entry, information costs and product differentiation.

The concentration index in Table A9.2 indicates the proportion of industry sales accounted for by the largest three enterprises. For example, in the car industry the largest three companies accounted for 60% of total industry sales.

Product differentiation

Products can vary in differentiation, from highly undifferentiated, such as a particular grade of steel, to highly differentiated as is the case with numerous different brands of soap.

The issue of product differentiation can be simplified somewhat by recognition of a two-way classification:

- *Real product differentiation* where, for example, one product is better designed or of better quality than another. Note too that real product differentiation may be in terms of better service, guarantees, credit facilities and so on.
- *Imaginary product differentiation* where products are functionally identical, but are differentiated in the eyes of the consumer, e.g. by colour, additives, perfume, packaging.

Note that products may also be differentiated by ambient qualities associated with the product, e.g. the manner in which sales staff interact with customers, availability of credit, and so on.

One effect of product differentiation is to give the seller some degree of monopoly power over his market, i.e. to render the demand curve facing the seller more inelastic, with the implication of the possibility of abnormal profits.

Advertising and product differentiation go hand in hand because a major means of increasing (particularly imaginary) product differentiation is by advertising. This link can be clarified by classifying advertising as informative or competitive.

- *Informative advertising* solely (or largely) imparts information, e.g. ‘For Sale’ columns in newspapers.
- *Competitive advertising* (or persuasive advertising) seeks to influence potential consumers without increasing their knowledge of the product. Half an hour watching commercial television will give adequate examples of this. In excess, this form of advertising may lead consumers to be confused to the point where they behave in an economically irrational manner; for example, they purchase the higher priced of two apparently identical products because they think it must be superior. There is considerable debate about this form of advertising which we will omit here.

Barriers to entry

Entry barriers were discussed earlier but note that exit barriers may also exist; for instance BHP probably have many cost arguments against closing down their steel-producing activities.

Buyer concentration

An extreme form of buyer concentration occurs when there is a single buyer, but there are other possibilities where a number of buyers group together to bargain with sellers. J.K. Galbraith introduced the concept of 'countervailing power' to describe a situation where buyers may combine to obtain a better deal in opposition to strong power on the selling side of the market. A case of this in Australia is the co-ordination of Japanese mineral buyers in confrontation with Australian sellers competing for sales contracts.

Buyer concentration is likely to be greater in the case of producer goods, but large bulk purchases by retail chains from oligopolist manufacturers provide scope for the exercise of countervailing power on behalf of the consumer.

Cost structure

A firm with fixed costs that are a large proportion of total costs will have a stronger incentive to cut prices when demand falls (as in a recession) than firms with low fixed costs. The high fixed cost firm will also suffer a greater loss of profits. The high fixed cost firm is less willing to spread its fixed costs over a declining output than is the low fixed cost firm. From this we may speculate that in such situations the incentive for firms to collude, to hold prices up and restrict competition, is likely to be greater.

Diversification

Diversification occurs when a firm in one market enters a different market. This may be entry into:

- a new product market, e.g. a cigarette company starting to produce chewing gum;
- a new geographic market, e.g. a company starting to sell its products in hitherto unentered country.

Motives for firms diversifying include the following:

- spreading the risks associated with involvement in only one market;
- application of established expertise in new areas;
- a more efficient use of fixed resources.

A diversifying firm may surmount entry barriers and thereby increase competition by reducing the height of those barriers. On the other hand, the diversified firm, having entered a new market, may be in a position to control the market or even force specialist competitors from the market.

Vertical integration

There are two forms of vertical integration:

- *Forward vertical integration*, when a firm starts to manufacture products which use the firm's previous products as raw materials or inputs, or when a firm moves into the final distribution and marketing of final products.
- *Backward vertical integration*, when a firm starts to produce input products which it previously purchased.

Motives for firms becoming vertically integrated include the following:

- economies in production or distribution;
- reduction of uncertainty in supplier markets (backward integration);
- protection of market share by producing products which are differentiated by brand names and advertising (forward integration).

Horizontal integration

Horizontal integration occurs when a firm buys out another firm which manufactures an identical or similar product. The results of this are obviously a reduction of the number of firms in the industry and a movement toward larger firms.

Motives for firms horizontally integrating include the following:

- reduction of risks by geographic diversification, for example a strike in one plant need not affect operations in other plants of the organisation;
- reduction of competition, i.e. the number of competing firms is reduced;
- acquisition of capital equipment not otherwise readily available.

Conglomerate integration

Conglomerate integration occurs when a firm buys out another firm which manufactures a product that is unrelated to the product or products produced by the buying firm, i.e. it is integration that is neither vertical nor horizontal. The result of this form of integration is the emergence of large corporations.

You will appreciate the last three items commented upon in the above list refer to different classifications of mergers (i.e. vertical, horizontal and conglomerate integration).

If you are seeking further reading on these structural elements read Martin (1994), chapters 8 and 9.

Conduct

In the discussion of market structure we gave a reasonably complete, if brief, outline of some elements that may contribute to the environment within which firms operate. 'The importance of market structure lies in the way it induces firms to behave' (Caves et al. 1981, p. 71). It is that behaviour which constitutes their conduct in the market and it is to the elements of conduct that we now briefly turn our attention.

Unfortunately, one cannot generalise so readily about conduct elements as we did for structure because the conduct of firms in a market is assumed to derive from a particular market structure. Since there are several market structures there are many possible conduct reactions. Over the years economists have developed a number of different models that can be used to analyse certain aspects of the conduct of firms operating within various structural environments. Two of these, with which you have some familiarity, are pure competition and pure monopoly. In these two extreme cases conduct is predictable, particularly when the goal of profit maximisation is assumed. When we move away from those extremes, particularly into the world of oligopoly, circumstances become more complex. Nevertheless, we shall briefly discuss the elements listed in Table A9.1.

Pricing and output policies

You should now be familiar with price and output decisions under the four basic market structures, so very brief comment is made about pricing here. Let us just note three points:

- Simple (and simplifying) economic models often assume that a firm charges only one price for a particular product; in fact there may be several prices. The comments above on price discrimination give some insight into this.
- The ability of a firm to control prices (or output) is a reflection of its power (derived from structural elements) in the market. This power may be enhanced by collusion, either explicit or implicit.
- Pricing practices may vary among short-run or long-run profit maximisation, pricing to deter entry, resale price maintenance, odd-number pricing and so on.

Output decision making is related to pricing through demand schedules. In simple models it is total quality of output that is considered and determined. But a firm's output policies must also have regard to such matters as:

- distribution of output (one theoretical solution follows from third degree price discrimination);
- who is to sell the firm's products;
- under what conditions wholesalers or retailers are allowed to sell the firm's products.

Advertising

We have already commented on advertising. Obviously any advertisement may incorporate both informative and competitive (or persuasive) components. To the extent that an advertisement is objective in providing information about the intrinsic nature of a product, it contributes towards making markets more perfect. But, as we have noted, advertising may also be employed to differentiate products in the minds of buyers to a greater extent than is justified by intrinsic product differences, thereby confusing buyers. This serves to make markets less perfect.

Theoretically, the advertiser can maximise the benefits from advertising by equating the marginal cost of advertising with the marginal revenue derived from that advertising. A little reflection will reveal great practical difficulties with attempts to do this. One problem concerns the time period used in such marginalist calculations. The benefits of advertising that are designed to establish brand loyalty may extend far into the future and the costs may extend far back into the past.

Nor should the social benefits and social costs of advertising be overlooked. One does hear of, and sometimes meet, people who claim to have derived some pleasure (social benefit) from a particular advertisement. Examples of social costs of advertising probably spring more readily to mind.

Product quality

Rivalry between firms may be conducted in terms of the quality of the product. For a firm to do this, it will be necessary to advertise in order to inform buyers of changes in the quality of products. Competitive aspects of an advertisement can also be used to create imaginary product differentiation. The question of whether such differentiation is real or imaginary may be difficult to decide.

Within the context of product quality we should also mention unnecessary or dubious quality changes, e.g. slide instead of rotary controls on audio-visual equipment or where slight changes in later models of a consumer durable lead to difficulties in repairing the earlier model. In some circumstances it seems that product changes, perhaps introduced with an eye to attracting consumers, actually reduce, or hold, the quality of the product below its potential quality.

Product variety

The different types of product manufactured by one organisation may be diverse, e.g. chemicals, paint, seeds. We mentioned this above under 'Diversification'. Also, organisations frequently produce many variations of a product in an attempt to satisfy the varied tastes of consumers. Producers may offer a range of products as optional extras added to basic products (e.g. motor cars), or by selling the same product under different brand names (e.g. soap powders), the objective being to increase or maintain the producer's share of the market.

Product variety is necessary for consumer welfare but the availability of wide variety (as in the above examples) may represent an inadequate variety of products. To argue that sales levels indicate consumer satisfaction can be misleading because consumers are obliged to choose from the available variety. If variety is restricted, e.g. by collusion or government regulation, then consumer welfare is impaired because choice is restricted.

Research and development effort

Research and development (R & D) effort is not undertaken by all firms. A window-cleaning firm, for instance, is unlikely to be involved in R & D.

R & D effort appears to be related to such things as firm size, level of profits, degree of seller concentration and diversification. There are various suggested motives for organisations becoming involved in R & D, e.g. development of new products to obtain advantage over competitors or because an R & D department in the organisation may be seen by management as a status symbol.

Because of this possibility and in the light of what has been said under 'Product variety', it can be appreciated that some R & D effort might not be deemed beneficial to consumers.

Reflect on the conduct elements which seem relevant to the organisation for which you work. If this seems inappropriate in your particular case you might like to identify relevant conduct elements in another industry.

Performance

In discussing performance, we are concerned with an appraisal of the actual results of the operation of a market compared with the potential results from the viewpoint of society. The objective is to highlight the difference between the actual and the potential performance in order to reduce the divergence.

A complication is that our performance criteria are strongly inclined to be idealistic. So our appraisal is a three-stage affair: ideal, potential and actual. This of course leaves much room for debate about an acceptable difference between ideal and potential, as well as between potential and actual performance.

As with structure and conduct elements, we now comment briefly on the performance criteria listed in Table A9.1, before complicating the simple S–C–P framework.

Allocative efficiency

Allocative efficiency refers to the efficiency with which resources are allocated between industries. By reference to the purely competitive model we know that resources are efficiently allocated when price equals marginal cost. If the price of a good is greater than the marginal cost of producing it then presumably output is less than consumers desire; too few resources are allocated to producing the good and this explains why consumers are prepared to pay a price greater than marginal cost. Therefore, allocative efficiency requires price to equal marginal cost.

Productive efficiency

Productive efficiency refers to the efficiency with which resources are used in a firm. Again by reference to the purely competitive model, we know that productive efficiency is maximised at the output level where short-run average costs are minimised. At output levels less than this the firm is not fully using its plant, that is, it has excess capacity (a normal state of affairs). At output levels greater than this the firm is overloading existing plant and must decide whether to cut back output or expand plant.

Productive efficiency requires output at the level where short-run average costs are at a minimum, i.e. where an existing plant is fully used.

Industry efficiency

Industry efficiency refers to the exploitation of economics of large scale. Yet again by referring to the purely competitive model, we know that economies of scale are fully exploited at the output level where long-run average costs are at a minimum. At output levels less than this, firms in the industry are not fully exploiting economies of scale (again a normal state of affairs). At output levels greater than this, the firm is experiencing dis-economies of large scale and should take remedial action, for example by decentralising decision making or by reducing the size of very large plants. Industry efficiency requires output at the level where long-run average costs are at a minimum, i.e. where economies of scale are fully exploited.

It has often been repeated by industrial organisation economists in Australia that, whilst many of our industries are concentrated, they frequently contain too many small-scale firms and/or plants, raising producing costs and often weakening the country's ability to compete in export markets (and thereby reducing our real incomes). Australia's Productivity Commission (previously the IAC), the body charged with advising government as to the protection levels it should grant industries, has often drawn attention to this source of inefficiency in Australian manufacturing industries. A recent example has been in their review of protection to the car industry post the year 2000. The car industry is an industry characterised by significant economies of scale and all Australian car plants are substantially smaller than those from which imports are sourced.

Distributive efficiency

Distributive efficiency refers to the distribution of products among consumers. Distributive efficiency is achieved when all products are distributed among consumers so that all consumers maximise their utility.

Advertising expenditure to sales ratio

It may be argued that the purpose of advertising is to increase demand and therefore sales. Undoubtedly advertising something has this effect–but not always. Advertising may also be undertaken, out of necessity, to maintain market share. Intensive advertising between rivals may have little effect on respective market shares, leaving customers paying the cost of this effort through higher prices.

Now just suppose that detergent manufacturers decided that 80 per cent of their advertising was unnecessary and cut the product prices by amounts reflecting the cost savings. Would consumers be happy? The possible outcomes of any such action might be as follows:

- newspaper prices would probably increase;
- fewer magazines would be available;
- there might be less commercial television; and
- there would definitely be some unemployed advertising personnel!

Notice that economists are likely to argue in favour of a low advertising to sales ratio to minimise resource misallocation. On the other hand, business people may favour a high advertising to sales ratio as a sign of aggressive marketing. Remember that performance assessment is undertaken by economists from society's viewpoint and so may conflict with business goals.

Price stability

Price stability is usually regarded as a macroeconomic topic but it is also relevant here. We know that firms with some degree of monopoly power have some ability to control the prices of their own products and this will have a resultant impact on profits.

For example:

- Prices may be increased if costs increase. Price is less likely to be raised if the cost increase is unique to one firm than if all rival firms experience a similar cost increase.
- Prices may be reduced if costs fall, particularly where the fall in costs is a long-run phenomenon (as with electronic calculators).
- Prices may be charged even if costs do not change.

The general economic view is that product price should not markedly exceed the marginal cost of its production because, as has been explained previously, price greater than marginal cost signals resource misallocation. If price approximates marginal cost then high levels of abnormal profit will not be made. But economists do recognise that a moderate level of abnormal profit is necessary for capital expansion and the adoption of new technology.

Business people may hold the contrary view, that profit should be high. High profit is frequently regarded as a (the?) signal of business and managerial success. Note that the final statement in the last section on advertising expenditure to sales ratio is again relevant.

Caution

At the outset in this appendix it was mentioned that this framework assumed that there is a unidirectional causal relationship between structure and conduct and conduct and performance. This need not be the situation in all cases. For example, in some situations performance may influence conduct which in turn may determine structure. The framework needs to be applied carefully and creatively if it is to be meaningful and , most importantly, you need to understand the dynamics of the industry being studied.

Another omission from our simple framework is the role of government. Governments are vitally concerned with the issues covered in this appendix. Witness the debate on bank mergers and takeovers that raged in early 1997 prior to the release of the Wallis Report and the continuing concern governments have with concentration in the telecommunications and media industries.

Governments influence structure, conduct and performance through polices and regulations they actually put in place and by the prospect of policies they may put in implement.

The whole issue of government intervention to enhance industry performance is considered in depth in Topics 10, 11 and 12.

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Caves, K., Ward, I., Williams, P. & Wright. C. 1981
Australian Industry: Structure, Conduct, Performance
Prentice Hall, Sydney.

Further reading

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The Economics of Strategy
John Wiley & Sons, New York (Part 2, Chapters 7–11).

Caves, K., Ward, I., Williams, P. & Wright. C. 1981
Australian Industry: Structure, Conduct, Performance
Prentice Hall, Sydney.

(This reading may date to the 1980's but the issues have not changed, and it is still regarded as one of the classics in this area.)

Martin, S. 1994
Industrial Economics: Economic Analysis and Public Policy
2nd edn, Prentice Hall, Englewood Cliffs, New Jersey (Chapters 1, 7–9).

Suggested answers

Topic 9

In-text questions

Question 9.1

See Begg et al. (2000), pp. 146–8.

Question 9.2

(a) *G*

(b) *F*

(c) Yes, equal to the value of the rectangle (*FLKE*).

(d) *SR*

(e) No supernormal profits are obtainable in the *LR*.

Question 9.3

(a) Yes, since advertising must be paid for, it increases a firm's costs.

(b) In the markets studied, it appears that advertising improved the consumer's knowledge of prices and services being offered by various sellers. Without advertising, the cost to the consumers of obtaining such information is relatively high. Armed with this information, consumers were in a better position to seek out relatively low prices, and sellers were more likely to offer them.

(c) Because the federal regulators felt that such restrictions impaired the effectiveness of the competitive process. In particular, as shown in the table in the question, consumers seem to pay higher prices when such restrictions exist. In fact, there tended to be a drop in eyeglass prices following the federal ruling.

Source: Mansfield (1994), p. 398.

Question 9.4

Sunk costs constitute an effective barrier to entry. Once a firm has incurred a sunk cost it has no direct impact on future decision making; i.e. the opportunity cost on a resource that is sunk is zero. Therefore, where sunk costs exist, established firms have lower economics costs than the potential costs to new entrants. All costs are incremental for the new entrant.

Question 9.5

If the cartel is to maximise profits then production must be allocated among the various firms such that the marginal costs of the last units produced by each firm are equal to (or at least no greater than) the value at which the industry's overall marginal costs equal the marginal revenue of the last unit sold.

(a) Price = $70

Output = 7 cartons per hour

(b) Firm 1: 2 cartons per hour

Firm 2: 2 cartons per hour

Firm 3: 3 cartons per hour

Note that the marginal cost of the last unit produced by each firm must be equal to or less than the profit maximising industry marginal cost.

Review questions

Review question 9.1

(a) Interdependence in decision making is said to exist when:

  (i) decision makers are aware that the decisions that each operator in the market makes will have an impact on others in the market; and,

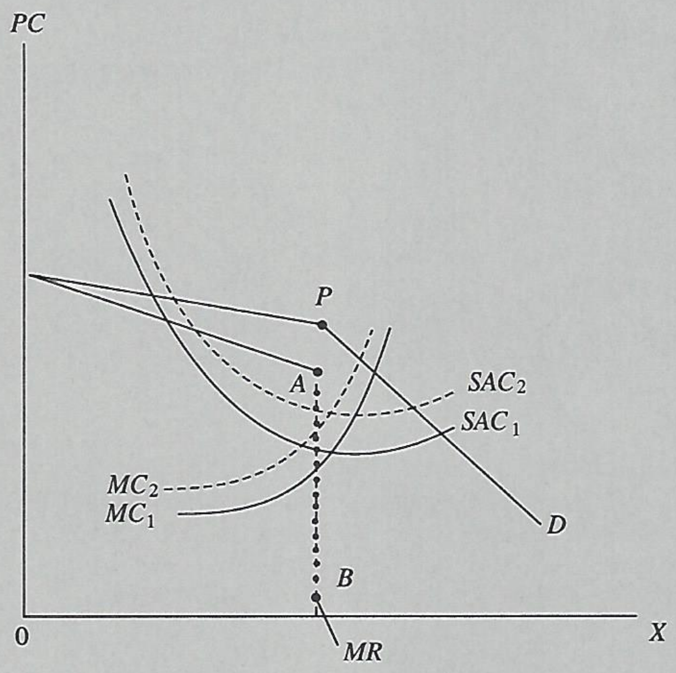
  (ii) decision makers assess the likely strategies and responses of other firms when making decisions.

(b) Interdependence is likely to result in the development of strategic games and, in some cases, encourage collusion.

Review question 9.2

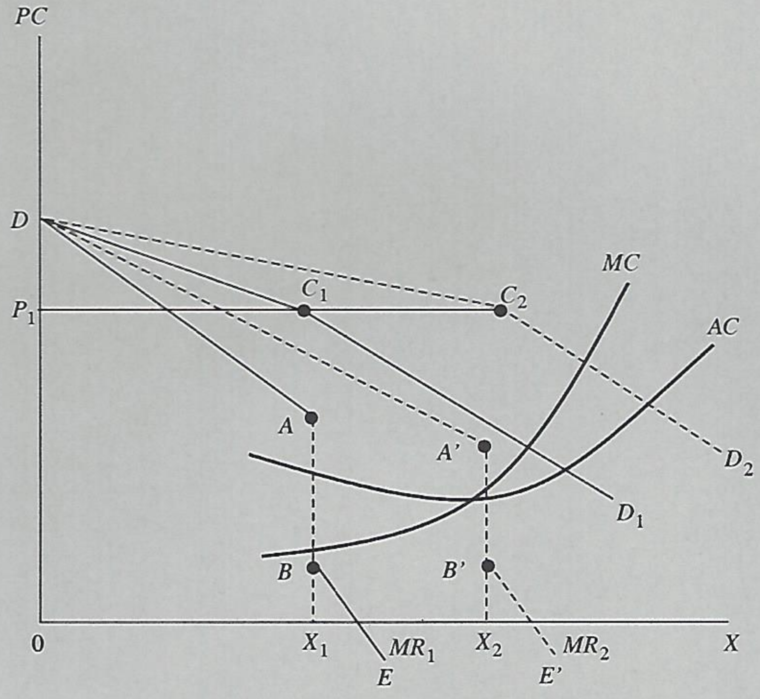
(a) Drawing kinked demand curves

  (i) A change in production costs



The discontinuity (between *A* and *B*) of the *MR* curve implies that there is a range within which costs may change without affecting the equilibrium *P* and *X* of the firm. In the graph, so long as *MC* passes through the segment *AB*, the firm maximises its profits by producing *P* and *X*. This level of price and output is compatible with a wide range of costs. Thus the kink can explain why price and output will not change despite changes in costs (within the range *AB* defined by the discontinuity of the *MR* curve). The greater the difference of elasticities of the upper and lower parts of the kinked demand curve, the wider the discontinuity in the *MR* curve, and hence the wider the range of cost conditions compatible with the equilibrium price *P* and output *X*.

(ii) A change in consumer demand



There is a range through which demand may shift without a change in price although quantity will change. If the demand curve is kinked, a shift in the market demand upwards or downwards will affect the volume of output, but not the level of price, so long as the cost passes within the range of the discontinuity of the new *MR*. In the graph, demand moves out from DC_1D_1 to DC_2D_2 and marginal revenue from *DABE* to *DA'B'E'*. Equilibrium remains at P_1 but equilibrium output increases from OX_1 to OX_2.

(b) The key assumptions underpinning the kinked demand curve model is that decision makers will believe that: (i) if they increase their price the opposition will not follow them so the opposition will gain market share; (ii) if they drop price the opposition will match the fall in price to ensure they don't lose market share. The end result is price stability. This is very much a market share driven view of the world. The fallout in the early 1990s has resulted in more firms concentrating on profits rather than market share.

Review question 9.3	(b), (c), (d), (e), (f) and (h).
Review question 9.4	Refer to the study guide notes under 'Oligopolistic rivalry'. Note the tendency for firm to engage in non-price competition.
Review question 9.5	Once again, you will find the answer to this question in the study guide notes.

Models of oligopoly

Reading 9.1

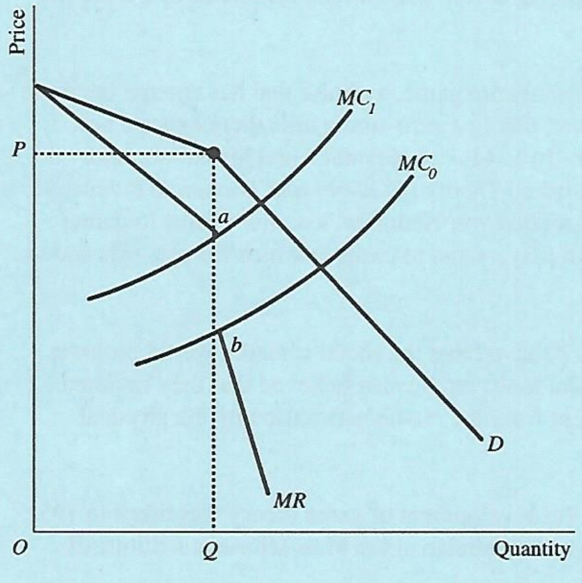
Economists have studied oligopoly and duopoly since the time of Cournot (see Our Advancing Knowledge, pp. 78–79). The earliest models were based on assumptions about each firm's beliefs concerning the reactions of another firm (or firms) to its own actions. A particularly influential model was proposed in the 1930s by Paul M. Sweezy, editor of the *Monthly Review* for the past 40 years.

Sweezy's concern was to explain why prices did not fall more quickly during the years of the Great Depression. He proposed a theory based on the following propositions about the beliefs held by firms:

- If we increase our price, we will be on our own — others will not follow us.

- If we decrease our price, so will everyone else.

The figure illustrates what happens if these beliefs are correct. A firm faces a demand curve for its product that has a kink occurring at the current price *(P)*. At prices greater than *P*, the demand curve is relatively flat, reflecting the belief that if the firm increases its price, it will be out of line with all of the other firms and so will experience a large fall in the quantity demanded. At prices less than *P*, the demand curve is relatively steep, reflecting the belief that since all other firms are matching the price cut, the increase in the quantity demanded will not be as large as the decrease in the quantity demanded resulting from a price rise.



The kink in the demand curve *(D)* results in a break in the marginal revenue curve *(MR)*. The profit-maximizing output *(Q)* is at the point at which the marginal cost curve passes through the discontinuity in the marginal revenue curve — the gap *ab*. If marginal cost fluctuates between *a* and *b*, an example of which is shown in the figure with the marginal cost curves, MC_0 and MC_1, the firm will change neither its price nor its quantity of output. Only if marginal cost fluctuates outside the range *ab* will the firm change its price and quantity produced.

Sweezy's model has two problems:

- It does not tell us how the price *(P)* is determined.
- It does not tell us what happens if firms discover that their belief about the demand curve is incorrect.

Suppose, for example, that marginal cost increases by enough to cause the firm to increase its price and that all firms experience the marginal cost increase. In such a case, all firms will increase their prices together—the belief that other firms will not match the price increase is incorrect. The firm's beliefs are inconsistent with reality, and the demand and marginal revenue curves, which summarize those beliefs, are not the correct ones for the purpose of calculating the new profit-maximizing price and output.

A widespread dissatisfaction with the state of the theory of oligopoly was a main source of impetus to the development of game theory, which was invented in 1928 by John von Neumann. A brilliant mathematician and physicist, and a pioneer in mathematical economics, von Neumann established the logical basis for the computer and built the first modern computing machine. He also worked on the Manhattan Project, which developed the atomic bomb in Los Alamos, New Mexico.

Born in Budapest, Hungary, in 1903, von Neumann studied in Budapest and Zurich and from 1931 worked at the Institute for Advanced Study at Princeton University. His mathematical brilliance was recognized at an early age and his first mathematical publication, which grew out of lessons with his tutor, appeared when he was only 18. But it was at the age of 25, in 1928, that von Neumann published an article that started a flood of research in game theory. In that article, von Neumann studied a game with two players in which the sum of the pay-offs is zero—what one player gains, the other player loses. (Bargaining for shares of a fixed pie is an example.)

Such a game is called a zero-sum game, a phrase that has entered common English usage. He proved that in a zero-sum game, there exists a best strategy for each player. In 1944, von Neumann and his collaborator Oskar Morgenstern published *Theory of Games and Economic Behaviour*, a book in which they extended von Neumann's earlier results to games involving any number of players and to cases in which the pay-offs added up to more than zero.

Von Neumann strongly believed that the social sciences would progress by applying mathematical tools, but he also believed that they required tools completely different from the mathematics used by the physical sciences.

The next major step in the development of game theory was taken in 1951 by John F. Nash, Jr., a mathematician at the Massachusetts Institute of

Technology (MIT), who developed the equilibrium concept that now bears his name and that you have learned about in this chapter.

Today there is an enormous volume of research being done on game theory, and a large number of brilliant economists and mathematicians are at work on the subject. Among these is John Harsanyi, who teaches decision science — the mathematical analysis of economic decisions — at the University of California at Berkeley. Harsanyi has studied games in which the players are not fully informed, and each knows some things that the others do not know.

Another interesting contribution is by Eric Maskin of Harvard and Jean Tirole of MIT, who have recently shown that even the kinked demand curve theory of Sweezy can be viewed as the outcome of a game. The particular game is one in which firms take turns at determining the market price and all other firms accept the price that has been set. The model proposed by Maskin and Tirole overcomes all the problems of the original Sweezy theory: firms' beliefs, on the average, are correct, and the model even predicts where the kink in the demand curve will occur — at the monopoly profit-maximizing price and quantity point.

Game theory has now firmly established itself as one of the main tools of analysis in mathematical economics.

Source: McTaggart, D., Findlay, C. & Parkin, M., *Economics,* 2nd edn, Addison-Wesley, Sydney, 1996, pp. 326–27.

Industry policy: The case for government intervention

Topic 10

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Suggested answers

Reading 10.1

Introduction

All economies are essentially 'mixed' in that some of the allocative decisions are made by independent actors in the market place while others are made either directly by governments or subject to the influence of governments. Government intervention is an important aspect of the economic environment in which Australian firms operate. In this, and the following topic, we study the rationale for government intervention into firm-level decision making. The emphasis is on understanding why governments choose to intervene in the market place and what implications this intervention will have for decision making and management of firms and public organisations.

Consider the following questions:

- What attitude will the government have to the merger of our firm with the opposition?
- Is it wise to upgrade our capital investment in a highly protected industry?
- Should we be planning to introduce cleaner technology in our factory?
- Is the government likely to privatise our organisation?

Questions of this nature are often critical to managers facing longer term investment decisions. In this topic we develop a general analytical model of government intervention which will help you come to grips with these important but difficult questions. In Topic 11 we will use the general framework to focus specifically on competition policy.

Objectives

On concluding this topic you should be able to:

- explain the nature and extent of government involvement in industry;
- interpret government intervention in terms of the private and public interest models;
- analyse the case for government intervention to improve efficiency;
- analyse the case for government intervention to improve equity;
- identify and discuss the main forms of market failure; and,
- discuss the concept of an optimal degree of regulation.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 4 and 16.

Reading

Reading 10.1
Industry Commission
'Features of Commonwealth regulation'

Nature and extent of government intervention

From your own experience you will be aware that government involvement in, and regulation of, Australian industry is pervasive. It occupies a large and increasing share of the time of business executives and other parties who appear before regulatory institutions. It results in a complex array of discriminatory effects on relative prices and the composition of output.

☐ *Read the introduction to Chapter 4 and Section 4-1 in Begg et al. (2000), pp. 43–6, for a summary of some broad indicators of government involvement in the major OECD economies.*

While Begg et al. (2000) make no mention of Australia it is probably safe to assume that Australia lies closer to the USA in terms of government spending and taxation than it does to Sweden. However, this sort of data only reflects the tip of the iceberg of government influence.

The problem with Begg et al.'s (2000) perspective on the issue is that the government activities and effects they cite are largely linked to their budgetary implications. However, many forms of government involvement have little direct impact on the national budget, yet can have enormous impact on the way firms are managed and markets function. For example, import quotas may have no direct budgetary implications yet could be the most important factor determining pricing behaviour and profitability in an industry. Similarly, government regulation of a monopoly (until recently telecommunications) or a duopoly (the recently scrapped two-airline policy) can have enormous impacts on an economy without showing up directly on the national accounts.

There are an enormous range and number of government policies and regulations used to stimulate or retard particular industries. Policy instruments used by governments to change the way markets operate include policies and regulations to influence prices, practices, import competition, conditions of entry to industries (licensing arrangements); and direct government participation in a number of markets (e.g. banks and airlines (until recently), major public services, defence industries, power and fuel). Table 1.2 in Reading 10.1 details some significant elements of business regulation in Australia as at 1996.

What forms of government regulation apply in your organisation? Do you think they are appropriate?

☐ *Reading 10.1 provides an overview of the extent of federal regulation and shows that, despite the publicity given to deregulation, there is evidence that the extent of regulation has been growing not falling.*

Question 10.1

(a) Has federal regulation of your organisation been increasing or falling? What about state administered regulation?

(b) For what reasons do you believe government regulation has increased?

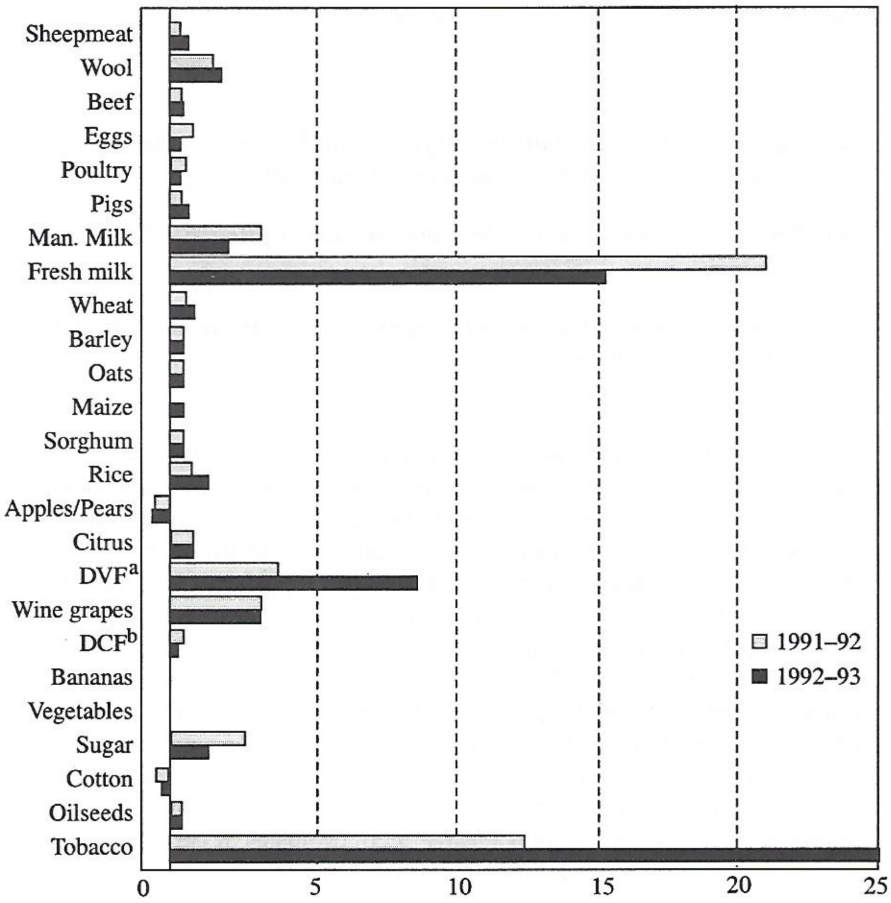
(c) What perception is there in your organisation of the impact of such increases in legislation?

The growth of regulation, both private and government, has been substantial in a large number of countries. A number of studies and books have appeared devoted to the economics of regulation. In Australia, the analysis of the economics of government regulation was substantially influenced by the establishment of the Industries Assistance Commission (IAC) in 1974. This body was charged with the role of systematically evaluating the case for government intervention in Australian industry. Their evaluation of each industry involved a series of public hearings, preparation of draft reports for public comment, and publication of final reports to government containing recommendations on the nature and extent of government in the industry studied. The IAC was a world leader in this area of study of government intervention and was the first organisation to publish a comprehensive set of estimates of the extent and impact of government intervention in industry. They promoted the measurement of effective rates of assistance as a means of summarising the overall impact of government intervention on the profitability of industry. (In 1996 the IAC was merged with the Bureau of Industry Economics and the Economic and planning advisory Council to form the Productivity Commission.)

Figure 10.1 summarises the extent to which government intervention has influenced the value added in Australian agricultural industries. The most notable features of this data are that assistance differs substantially between industries, and over time. Most industries receive little or no assistance while parts of the milk industry and the tobacco industry are relatively heavily protected.

On average, manufacturing industry is even more highly protected than the agricultural sector, with average effective rates of assistance generally running at double those for the agricultural sector. The relatively high rates recorded in the manufacturing sector reflect the high rates traditionally provided to the footware, clothing and textile sector and the car industry. The IC reported that Government assistance inflated value added in the clothing and footware industries by more than 60% in 1993/94 and by around 40% in the motor vehicle industry. (However, these figures have been challenged in some quarters.) These assistance rates have fallen substantially since the mid-1980s (when rates of greater than 200% were not uncommon) and protection in these areas is currently under review by the Howard Government.

Figure 10.1: Average effective rates of assistance to agricultural commodities, 1991–92 to 1992–93 (per cent)



a Dried vine fruit
b Deciduous canning fruit
Source: Commission estimates
Source: Industry Commission (1994), p. 300.

Why government regulation?

There are a number of reasons that can be advanced to explain why governments intervene in the market place. They can be broadly categorised as being consistent with one of two models of industry policy behaviour: the *private interest model* associated with Stigler (1975) and the *public interest model*.

Let's look at each of these in turn.

Private interest model

The private interest model is based on the notion that government involvement in industry occurs to benefit the private interests of particular groups involved in the industry. This theory was developed during the 1970s when economists, especially in the USA, started to reformulate a specific 'theory of economic regulation' that was designed to lead to an understanding of the regulatory process itself. Before turning to that, it is important to understand the motives for producing such a theory. As Stigler writes (1975, p. 123): 'To explain why many industries are able to employ the political machinery to their own ends, we must examine the nature of the political process in a democracy'. Stigler further argues (p. 123) that, 'because the political decision is coercive, the decision process is fundamentally different from that of the market'. He explains (p. 124) that there are two main differences in the political process as compared with the market, namely:

- decisions are taken simultaneously;
- the political process involves 'all' of the community, with no individual being able to opt out of its implications, which it is possible to do in market transactions.

Stigler's claim (pp. 132–4) is that economists must understand 'the basic logic of political life' if they want to propose reform. 'Economists should quickly establish the license to practise on the rational theory of political behaviour'.

The central Stigler thesis

Stigler advances testable propositions which the literature and subsequent academic debate has in fact put to the test, confirmed or queried. The central thesis of his argument (p. 114) is that 'as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit'. He concedes, however, that there are cases (obviously not general, in his view) where the regulation of an industry imposes burdens upon it.

The general thesis amounts to saying that the industry perceives an opportunity to use the powers of coercion implicit in regulation to its own advantage. In a later chapter he qualifies this proposition, which is restated in the following terms:

> 'The regulating agency must eventually become the agency of the regulated industry, if it (the agency) has a well-defined area of responsibility' (p. 163).

It is worth noting that this proposition states that it is more likely that industry will bend a regulatory instrument to its own wishes if the instrument is confined to an individual industry than if it is broadly based. From this he develops his policy conclusion, supporting the amalgamation of regulatory bodies on the grounds that it is harder for them to maintain their appropriations and to support specific industry proposals.

Stigler develops more specific propositions about the incidence of regulation:

- Larger industries have a lower relative cost of lobbying and accordingly benefit relative to small industries from the regulatory process. 'The smallest industries are therefore effectively precluded from the political process, unless they have some special advantage such as geographical concentration in a sparsely settled political subdivision'. (p. 127)

- Moreover, 'the more concentrated the industry, the more resources it can invest in the campaign for legislation'. (p. 128)

Specifically, on the licensing of occupations and activities, which implies a form of entry barrier, Stigler says (pp. 128–9) that this is more likely:

- the larger the occupation;
- the higher its per capita income;
- the higher its concentration in large cities;
- the greater the absence of cohesive opposition to such licensing.

Stigler's approach is based on the view that the state is a potential threat to industry, possessing the coercive power to help or hurt particular industries, and therefore able to change the balance between industries. He sets down, as the tasks of the theory of economy regulation, the need to explain:

- who receives the benefits or burdens of regulation;
- the form that regulation takes;
- the effects of regulation, including the effect on the allocation of resources.

Stigler identifies four types of regulation (pp. 116–19), which may be summarised as follows:

- subsidies, normally in the form of cash payments related to production;
- control over entry–by licence, tariffs etc;
- state influence to retard substitutes, or stimulate complementary products;
- price fixing, on public policy maintenance of price discrimination, to raise profits above competitive rate of return.

Question 10.2

Give one example of each of Stigler's four types of regulation which you believe are practised in Australia.

Despite government's propensity to regulate at the behest of powerful industry forces, there are limits to the political benefits that larger industries can obtain. Stigler identifies the following three sources of restraint on the growth of regulation:

- Regulation changes the balance of power in an industry, so that small firms within it have a larger influence than if the market were unregulated and they constrain the influence of the larger firms.
- There are costs of procedural safeguards.

- Outsiders are introduced into industry councils and the regulatory process. Their influences conflict with the needs of industry.

Application of Stigler's theory to Australian regulation

Stigler's theory has come in for considerable discussion in the literature. It is introduced here to present a series of speculations that will enable you to have a more critical appreciation of the process.

We need to ask whether or not Stigler's propositions occur in Australia.

- Has the regulatory process been commanded by industries, especially those subject to specific regulation, in order to satisfy their own wishes?
- Have large industries gained relative to small industries from the process of regulation?
- Are cases that deviate from Stigler's proposal exceptional or general?

Question 10.3

Consider the industry in which you work and answer the following questions:

- ***Is the industry specifically or generally regulated?***
- ***What form does regulation take?***
- ***Is it a large or small industry?***
- ***If it is a large industry, does it appear to have gained relative to small industries or not?***
- ***Has regulation affecting the industry been increasing during, say, the last two decades?***
- ***Is the regulation primarily for the benefit of the industry or does it impose burdens on the industry?***
- ***Has the regulation occurred as the result of political lobbying by the industry?***
- ***Are there any prohibitions or controls on entry to the industry? If so which, if any, of the four points made by Stigler in this context are relevant?***

The private interest model explains regulation and government intervention in general as a response to interest group pressures. While there is little doubt that at least some intervention can be explained by this model, it is arguable just what proportion of government intervention has come from these market pressures. An alternative view is that politicians and other policy makers develop and implement policies to advance the well being of society in general. This is essentially the notion behind the public interest model.

☐ *Before moving on to the next section on the public interest model, you should read pp. 257–65 in Begg et al. (2000)—up to Section 16-5. In the next sub-section we elaborate on the points made by Begg et al. (2000) and place the theory of welfare economics in a more applied framework.*

The following questions may assist you in focussing on the key ideas presented in the text.

- *What is meant by Pareto-efficiency and under what conditions can it be achieved?*
- *How may distortions in markets arise?*
- *How can the effect of distortions on allocative efficiency be minimised?*

Public interest model

Government regulation may arise, or may be seen as necessary, because of the inability of the market to bring about results that are in the public interest. There may be a case for government intervention on public interest grounds to either improve the efficiency with which resources are used or achieve non-efficiency objectives such as changing the distribution of incomes—the themes of allocative efficiency and equity discussed in your text.

Non-efficiency objectives

There are a large number of objectives that society may pursue that are not specifically related to efficiency and are not likely to be achieved through the operation of a free market. These objectives involve merit goods, or goods or services that society thinks should be consumed regardless of the decisions of individuals in the market place. The identification of merit goods often involves laying aside the notion of consumer sovereignty, in that policy makers are deciding what goods or services society should consume because of their judgement of the worth of this consumption to society. For example, government support for the performing arts could be justified on the grounds that such activities are merit goods. The politicians may feel that a certain level of activity in the artistic community is desirable but that the market will not provide that level.

Can you think of other merit goods or services? What objective(s) do they represent?

In evaluating government intervention to achieve non-efficiency objectives, organisations such as the Productivity Commission will generally go through an evaluation process along the following lines:

- identification of the objective being pursued;
- identification of the alternative policy instruments that could be used to achieve the objective; and,
- evaluation of the costs of achieving the objective and identification of the instrument that will achieve the objective at least cost to society.

Having gone through this evaluation process, the role of the economist stops and it is up to the policy makers to decide if achieving this objective is worth the cost indicated. It is important to realise that although we are talking about non-efficiency objectives, scarce resources are involved and decisions on trade-offs must be made.

Efficiency objectives

In a perfectly competitive market the operation of the market system will produce an efficient outcome. It will be efficient in the sense that the cost of producing the last unit of output (as shown by the height of the industry supply curve) is just equal to the value of last unit of output to society (as shown by the height of the demand curve). As long as the demand curve is a true reflection of society's valuation of the output and the supply curve accurately measures the opportunity cost on all resources used in the production of the good or service, a free market will produce an efficient outcome. In many cases, if not all, these conditions are not met and we have a necessary but not sufficient condition for government intervention on efficiency grounds.

Where the free operation of the market fails to produce an efficient outcome we have market failure. Begg et al. (2000, p. 265) define market failure as occurring in:

> '... all circumstances in which equilibrium in free unregulated markets ... fail to achieve an efficient allocation.'

As you have read in Begg et al. (2000), the major sources of market failure are:

- public good characteristics of goods or services;
- the presence of externalities;
- the exploitation of market power;
- imperfect information;
- divergences between social and private discount rates; and
- government induced distortions such as taxation and environmental regulation.

We review each briefly here.

Public goods

So far in this unit we have implicitly assumed that all goods and services were private goods in the sense that they have two key attributes.

1. There is rivalry in consumption in the sense that only the user of the good benefits directly from its consumption. If you drink a can of drink, no one else can consume that same can of drink.
2. The supply of the good is subject to exclusion. This means that it is possible and financially feasible to restrict consumption to those who pay. If you do not pay for a can of drink the shop owner can stop you consuming it.

Not all goods have these two characteristics. Goods and services that are public goods have very different characteristics to private goods.

1. The same unit of the good can be jointly consumed by more than one consumer (non-rivalry in consumption). The use of a weather forecast by one person does not stop another person from consuming that same piece of information.

2. Once the good has been supplied to one person, it is impossible, or prohibitively expensive, to prevent others from consuming it even though they have not paid to do so (non-excludability). If society provides police protection in an area, all residents will benefit.

The implications of public goods characteristics are that a free market will tend to under-produce these goods relative to the allocatively efficient level. If a good is non-excludable there is an incentive for a person to not pay for the good or service. They may *free ride* in the sense of waiting for someone else to purchase the good and then consume the good at no personal cost. If firms cannot get consumers who want the good to pay for it, they will not produce it or at least under-produce it, relative to the level which is consistent with marginal cost equal to demand.

If the good or service is non-rival in consumption, the marginal cost of supplying an extra consumer, once a unit is produced, is zero. Allocative efficiency would dictate that price should be equal to marginal cost which, in this case means a zero price. With no revenue, production would not occur. If firms do charge (i.e. the good is excludable but non-rival) production would lead to some consumers who would place a positive value on the good missing out on consumption. Once again there will tend to be an under-production of the good.

Not many goods are pure public goods in the sense that they are both non-excludable and non-rival. Many non-rival goods are excludable and are produced by private firms with no government assistance. These goods are sometimes called quasi-public goods.

Question 10.4

Classify each of the following goods as pure public goods, quasi public goods or private goods.

(a) national defence

(b) national parks

(c) railway services

(d) water

(e) union membership

(f) public hospitals

[Hint: Goods provided by the public sector are often not public goods (e.g. bank services) and goods or services provided by the private sector may be quasi (but pure) public goods (e.g. information).]

Externalities

An implicit assumption in demonstrating the optimality of the freely operating competitive market is that all costs and benefits accrue to the decision makers directly involved. This means that the costs a firm confronts when it decides to produce a good are identical to total cost to the community from that production process. In other words there are no costs associated within the industry that are imposed upon third parties. Under this assumption, private costs and private benefits are equal to social costs and social benefits, respectively.

There are many cases where this assumption is not the case. For example, there are cases where the costs of production that the producing firm faces is less than the cost that society faces. When a factory produces pollution, they can front the production costs while society as a whole confronts the production costs plus the pollution costs. In this case the pursuit of private profits will not be socially optimal, as a negative externality exists.

The key characteristics of an externality are that:

1. there is a divergence between private and social costs or benefits; and

2. the externality is not transmitted via the price mechanism in terms of changes in market costs or returns.

Externalities can be negative (pollution) or positive (increase in crop yields due to pollination attributable to beekeeping). They may flow from the production process (pollution) or the consumption process (litter).

Where there are positive externalities, the market system will under-produce the good relative to the social optimum. If the externality is negative the market will over-produce the good.

☐ *At this point, read the remainder of Chapter 16 (from Section 16-5, p. 265) which deals with the matter of externalities.*

What externalities have you seen taking place today?

Exploitation of market power

We have seen in previous topics that imperfect competition can lead to a market price that exceeds the marginal cost of production. This means that the good will be under supplied in a free market.

Imperfect information

The virtues of the market mechanism assume that consumers and producers have all the information necessary to make their decisions. In most cases people making decisions in the market lack information. These information imperfections could relate to the characteristics of the good or prices from alternative suppliers on the demand side and on the supply side, the range of production alternatives and available technology.

Divergence between planning horizons

Private firms often have shorter planning horizons than society deems appropriate. This means they will tend to over invest in projects that pay-off quickly and under invest in projects that offer longer run returns relative to the social optimum mix.

Government distortions

In some cases the markets will fail to produce a socially optimal level of output because of government imposed distortions. These distortions could be inappropriate policies due to the influence of sectional interest groups. The inappropriate policies may also relate to policies that have outlived there usefulness.

There was a general view in the community that the two-airline policy which operated until recently was an example of such a distortion.

Sections of the banking community would argue that significant elements of the set of government controls over the banking sector are also unnecessary distortions that create market failure. This view is probably more controversial.

☐ *Read Section 4-2 in Begg et al. (2000), pp. 46–49, for a discussion of these forms of market failure and why government intervention may (as they stress—at least in principle) improve the allocation of resources.*

Framework for government intervention

So, we have seen that markets may fail for a number of reasons, and these *may* give governments reason for intervention. In evaluating government intervention on efficiency grounds, policy analysts would generally work through the following framework:

- Identify the cause of market failure.
- Identify the possible policy instruments to deal with the market failure.
- Identify the most appropriate policy approach.
- Assess whether the implementation of the most appropriate policy would result in a net gain to society.

It is important to note that the presence of market failure does not justify government intervention. In many cases where market failures exist, an analysis of the problem would lead to the conclusion that the correction of the market failure would create greater costs than the problem itself. Similarly, if intervention is appropriate, it requires careful analysis to decide what is the most appropriate form of intervention. There are always a number of intervention options. The option that deals with the cause of the market failure directly, rather than the symptoms, is likely to be the most cost-effective instrument.

Identify an externality involved in your industry and consider the alternative ways this externality could be dealt with.

Identify a form of government intervention in your industry and identify who are the winners and who are the losers from this policy.

The obvious conclusion to be drawn from this discussion is that we probably cannot explain government intervention in one simple model. Both the private and public interest models are relevant at times. It would be naive to assume that policy makers are totally driven by public interest considerations, but it would be overly cynical to suggest that it has not been important in motivating many significant policies in Australia.

One could argue that the public and private interest models are competing explanations for why we *actually have* government intervention. The public interest model has the added value of providing us with a framework for evaluating what intervention we *should have*.

An optimal degree of regulation

In the previous section we noted that there are generally a range of policy options open to government to deal with any problem or meet any objective. The selection of the most appropriate policy can be couched in terms of the optimal extent of regulation. In some cases governments will opt for very stringent and extensive regulation or control while in other cases they may choose zero control. The imposition of government controls imposes costs upon society. These costs include the cost of enforcing the control and the cost to society of stifling innovation and competition at the firm level. The tighter and more extensive the regulation, the greater will be the total and marginal costs of regulation. Consider the case of consumer protection legislation. The costs of imposing this type of legislation include the cost of setting up a bureaucracy to run it, the cost of policing the market place, the cost of court time taken up with prosecutions, and the cost to firms and society of possibly stifling competition and innovation through overly restrictive controls on business practises.

One example of the cost of regulation is highlighted in the extract below.

Increasing cost of emission control

In 1970 the U.S. Congress enacted that a 95 percent reduction in certain harmful emissions from auto exhausts be achieved by 1976. Critics, especially from the automobile industry, questioned the economic rationality of such an extreme goal. They contended that it is disproportionately more costly to go to higher and higher levels of emissions control, just as it is harder and harder to squeeze the last few drops from an orange.

A later government study tended to support this objection. In the table, note how sharply the increments of cost begin to rise after 80 percent emissions reduction has been achieved.

Cost of emissions reductions

Reduction in emissions (%)	Cost per car
50	$45
55	55
60	62
65	70
70	80
75	90
80	100
85	200
90	375
95	600

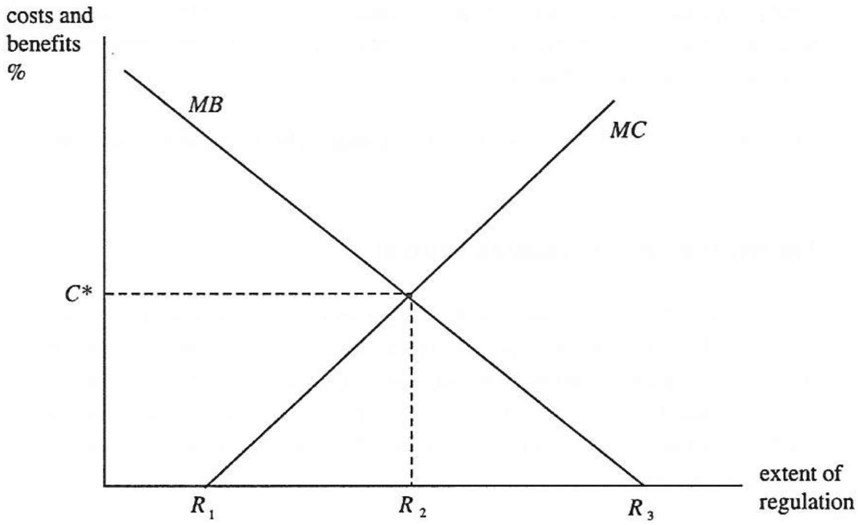
The fact that rising levels of emissions control are increasingly expensive does not tell us just how far society should or should not go in this direction. So the data above do not tell us that Congress was wrong, although it might raise a question in our minds.

Source: Hirschleifer (1988), pp. 182–3.

The benefits that flow from regulation represent the value of the reductions in damages to the community caused by the market failure. While the marginal costs of regulation are likely to be positively related to the extent of regulation , the marginal benefits of regulation can be expected to be negatively related to the extent of regulation. (We explain this below.) In the case of our consumer protection example these benefits would be reflected in the reductions in 'consumer rip-offs' and the improvement in the efficiency of operation of the market that may come when more complete information is available to potential consumers.

The marginal benefit and cost curves of regulation are portrayed in Figure 10.2.

Figure 10.2: Optimal degree of regulation



The marginal cost and marginal benefit of regulation are indicated by the curves *MC* and *MB* respectively. At low levels of regulation (less than R_1) there are no significant costs of regulation. As the extent of regulation is increased beyond R_1 the marginal cost of regulation rises. The marginal benefits of regulation fall as the extent of regulation is increased. Beyond R_3 units of regulation the benefits of additional regulation are negligible.

The optimal degree of regulation is given by the point where the marginal cost of an additional unit of regulation is just equal to the marginal benefits flowing from an additional unit of regulation. If the extent of regulation is allowed to increase beyond R_2, the incremental costs will exceed the incremental benefits to the community and so community welfare will fall. Similarly, if government imposes a lower level of regulation than R_2, the reduction in benefits will more than offset the reduction in costs, and so community welfare would fall again.

This model shows that it is optimal to have high levels of regulation in industries where the marginal costs of regulation are relatively low and or the marginal benefits of regulation are relatively high. Clearly, one would expect to see marked variations in the degree of regulation across industries. In some industries zero regulation may be optimal, while in others high levels of regulation may be welfare enhancing. For example, we expect to see, and do see, higher levels of control in the health services industry where the benefits to consumers of regulation are likely to be substantial, than in gardening services sector, where negligible specific regulation may well be optimal.

The model also provides a framework for explaining why the degree of regulation confronting an industry can differ markedly between countries. For example, if the marginal costs of workplace safety regulation are higher in developing countries than developed countries we would expect to see higher safety standards imposed in the latter. If this is the case, imposing developed country standards in developing countries would be welfare diminishing for the developing country and not enhancing.

Question 10.5

Explain why it may be socially desirable to have less stringent environmental controls on factory pollution in India than in Australia.

Summary

This topic has been a general introduction to the regulation of industry. Three broad areas have been discussed:

- the nature and extent of government intervention;
- an analytical framework designed to facilitate analysis of government intervention; and
- the concept of an optimal degree of regulation.

In working through this topic, you saw that government plays an important role in the market place. This role is changing all the time as information available to governments change, as the nature of problems change, as the objectives of governments change, and as the relative strengths of interests groups change. The private interest and public interest models outlined in this topic provide managers with workable frameworks for evaluating the likely future direction of regulation in their industries. The private interest model emphasise the role of interest groups in demanding regulation, while the public interest model shows when regulation will be welfare enhancing.

This general discussion provides a background to the analysis of regulation and will assist your understanding of the issue of competition policy covered in the next topic.

Review questions

Review question 10.1

What is the rationale for government involvement in the market economy?

Review question 10.2

What do we mean by market failure and what are the most prevalent forms of market failure in the Australian economy?

Review question 10.3

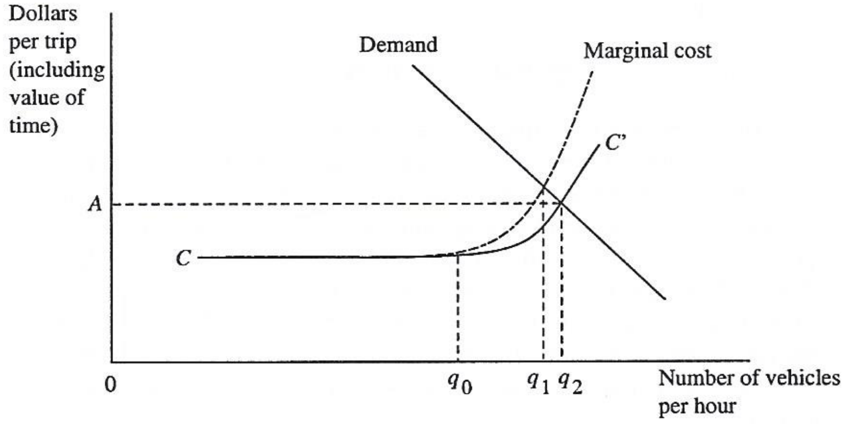
What role can an economist play in evaluating government intervention that has been put in place to achieve non-efficiency objectives?

Review question 10.4

'The socially optimal degree of control of pollution may still result in substantial levels of pollution.' Evaluate this statement with respect to a socially efficient use of national resources.

Review question 10.5

Each morning, thousands of motorists travel the route from Philadelphia's western suburbs to the central business district where they work or shop. Suppose that the full cost of this auto trip—including both the money costs (of fuel, oil, tire wear, and so on) and the value of the drivers' (and passengers') time—is measured along the vertical axis of the graph below, and that the number of vehicles attempting this trip between 7 a.m. and 8 a.m. on a particular day is measured along the horizontal axis. The relationship between the fuel cost of this trip to a motorist and the number of vehicles attempting this trip is CC'. The demand curve shows at each price of this trip (including both money and time costs) the number of vehicles that will set out on this route.



(a) If more that Oq_0 vehicles attempt this trip, the cost of the trip increases as more and more vehicles set out on this route. Why? Is this due to external diseconomies?

(b) How many autos per hour will travel along this route?

(c) Is this the economically efficient number?

(d) What measures might be taken to push the actual number closer to the efficient number?

Source: Mansfield (1994), p. 639.

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Suggested answers

Topic 10

In-text questions

Question 10.1

Obviously, your answers to parts (a) and (c) are in the context of your own organisation. In respect of (b), you may have considered as reasons:

- increased demands for social legislation (environmental, anti-discriminatory, etc.);
- increased attention to international obligations on the part of the previous labor government;
- introduction of pro-competitive legislation.

Question 10.2

(a) Subsidies:

Environmental work like 'land care'.

Research and development expenditure.

(b) Control over entry:

banks (but the controls have been relaxed);

universities;

water authorities;

doctors;

taxi industry.

(c) Retard substitutes:

Control on margarine production to benefit dairy industry.

(d) Price fixing etc:

taxis;

petrol (until recently).

Question 10.4

(a) pure

(b) quasi

(c) private

(d) private

(e) quasi

(f) private

Question 10.5

Australia is a wealthy country and its citizens place a high value on environmental qualities. In India people are poor and may be more concerned about pollution controls restricting job growth.

Review questions

Review question 10.1

Government intervention in the market economy can be justified to improve the efficiency with which resources are used or to achieve non-efficiency objectives.

Where the objective is to improve the efficiency with which resources are used, a necessary but not sufficient condition to be met to justify government intervention is that some form of market failure must exist.

Review question 10.2

Market failure occurs when the costs and benefits faced by producers and consumers in the market place do not reflect the true costs and benefits to society.

Obvious examples of market failure are pollution (externalities), abuse of market power (rent seeking), inappropriate regulation (government failure) and imperfect information at all levels. You could also mention the short term planning horizons of some managers and potential public good characteristics of some goods and services.

Review question 10.3

The evaluation of programs designed to achieve non-efficiency objectives involves:

1. Setting objectives.

2. Identifying the alternative ways the objective could be achieved.

3. Assessing the cost effectiveness of each alternative.

4. Assessing whether society should implement the most appropriate policy instrument.

The economist may be able to play some role in formulating the objective but her/his principal role is likely to lie with stages 2 and 3 of the process. Stage 4 involves value judgements rather than economic analysis.

Review question 10.4

Pollution is an externality and in the absence of government intervention too much pollution will be produced. The optimal degree of pollution depends on the relative sizes of the marginal cost to society of reducing pollution and the marginal benefit to society of reducing pollution. Zero pollution is seldom optimal. It may be optimal when the marginal benefit from reducing pollution is very high and/or the marginal cost of reducing pollution is very low.

Review question 10.5

(a) If more that Oq_0 vehicles per hour travel this route, the highway becomes congested. Traffic becomes tied up, it takes longer to make the trip, and the full cost (including time) increases. As more and more vehicles travel this route, the congestion gets worse. Each extra vehicle, by delaying other vehicles taking this route, is responsible for external diseconomies.

(b) Oq_2 vehicles per hour. If less than Oq_2 vehicles per hour travel this route, the full cost of the trip (indicated by the *CC'* curve) is less than the value of the trip to the motorist (indicated by the demand curve), and more vehicles will make the trip. If more than Oq_2 vehicles per hour travel this route, the full cost of the trip exceeds the value of the trip to the motorist, and less vehicles will make the trip.

(c) No. The economically efficient number is Oq_1 vehicles per hour. If more than Oq_1 vehicles per hour travel this route, the marginal cost to society of an extra vehicle's travelling this route (shown by the dotted line on the graph) exceeds the cost to the motorist driving this extra vehicle because the extra vehicle delays other motorists. Up to Oq_1 vehicles per hour, the marginal cost to society of an extra vehicle (shown by coloured line) is less than the marginal benefit (shown by the demand curve), and society gains if more vehicles per hour take this route. But above Oq_1 vehicles per hour, this is no longer true.

(d) Some economists have suggested that a tax be imposed on motorists that travel congested highways. In this way, the private costs would be brought closer to the true social costs. Tolls can also be used, at least under some circumstances.

Source: Mansfield (1994), p. 639–40.

Features of Commonwealth regulation

Reading 10.1

Industry Commission 1996

This chapter examines the nature of the stock of Commonwealth legislation. It also analyses recent trends in both Commonwealth primary and subordinate legislation. The amount of regulation, and its complexity, continues to increase.

Over the past three decades there has been a considerable increase in the amount of Commonwealth primary and subordinate legislation. Associated with this has been an increase in their length and complexity.

Increased regulatory activity is reflected in greater expenditure by Commonwealth and national regulatory agencies. Staffing has remained fairly constant in recent years, cost recovery (particularly by traditional agencies) has become more widely used, and there has been growth in new areas of regulation.

Analysis of the stock of Commonwealth Legislation

When considering the extent of any regulatory impact, the effects on all groups in the community are relevant, including businesses, consumers, taxpayers and other community groups.[1] However, traditionally the Office of Regulation Review's (ORR) focus has been on evaluating regulations which affect business, such as those which affect pricing policies, business income and management decision-making. For this reason, the regulatory impact on business is the principal focus of Chapter 1.

While the focus is on the impact of legislation on business, this does not imply that this impact is necessarily 'negative' in terms of the effects on the economy and/or the aggregate well-being of society.

There are currently some 1200 Commonwealth Acts in operation. Table 1.1 provides a breakdown of this stock of Acts into nine broad functional categories. The categories in the table are then ranked according to the extent to which they are likely to affect the behaviour and earnings of business.

While there is a degree of arbitrariness in such a classification, as individual Acts will sometimes fall within more than one functional grouping, it does provide a broad indication of the nature of the Commonwealth's legislation.

Table 1.1: Stock of Commonwealth legislation by functional category, as at February 1996a

Category	*Number*
Economic regulation	162
Assistance to industry	83
Social regulation	
Environmental	50
Other	92
Revenue raising	
Taxation	97
Non tax charges	180
International obligations	
Expenditure legislation not included elsewhere	212
Commonwealth administration	213
Total stock of Commonwealth legislation	**1196**

a Excludes supply and appropriation Acts.

Source: Office of Regulation Review estimates

Acts which have been classified as 'economic regulation' or 'assistance to industry' are those which have a clear impact on business, and together comprise 20 per cent of total Commonwealth legislation. Economic regulation may have either a narrow impact (such as the *Australian Wine and Brandy Corporation Act 1980)* or a broad impact (such as the *Corporations Act 1989).* Acts under the category of 'assistance to industry' generally apply to a relatively narrow sector— such as the *Bounty (Machine Tools and Robots) Act 1985*—although they can have flow-on effects to a large group of users and consumers.

The principal objective of most Acts described as 'social regulation', may not be to change business behaviour, but rather to change certain social behaviour. However, it can have an incidental effect on business decision-making. This broad category comprises about 10 per cent of total Commonwealth legislation.

Environmental acts can be very broad in application, such as the *Ozone Protection Act 1989,* or very specific in application, such as the *Environment Protection (Alligator Rivers Region) Act 1978.* Other types of social legislation, within the Commonwealth's jurisdiction, include occupational health and safety guidelines and motor vehicle design standards.

Revenue-raising Acts are also not primarily aimed at changing business behaviour or outcomes; however, they do in fact impact on business and affect decision-making. The costs of complying with tax regulations is a particular concern of business. Revenue-raising Acts account for nearly 25 per cent of all legislation.

Domestic legislation which enforces international obligations represent approximately 10 per cent of all Acts. Whether they have a significant effect on business will depend on the nature of the treaty ratified.

The remaining 35 per cent of the stock of Commonwealth legislation has little or no impact on business.

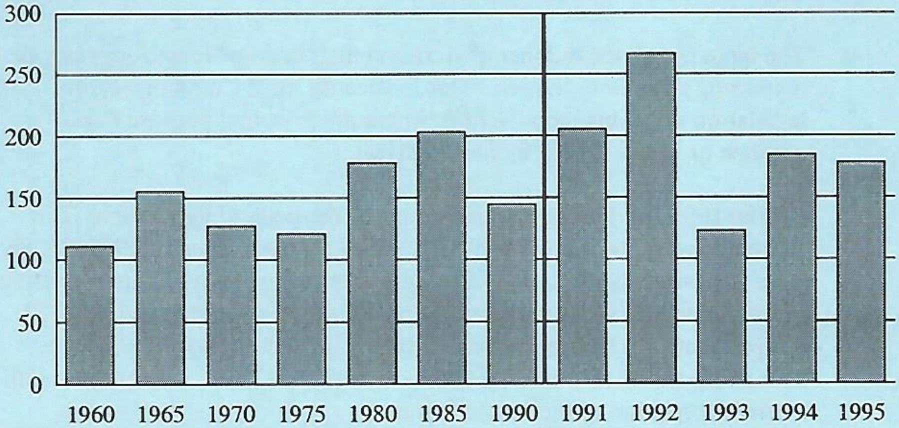
Trends in Commonwealth Legislation

The stock of Commonwealth legislation has been increasing over the past three decades (see Figure 1.1).

The average annual number of Commonwealth Acts promulgated since 1990 was 180, compared with only 130 in the 1960s and 1970s. However, no such clear trend is evident over the past 15 years—the number of enactments in the 1990s appears, on average, not to be substantially more than in the 1980s.

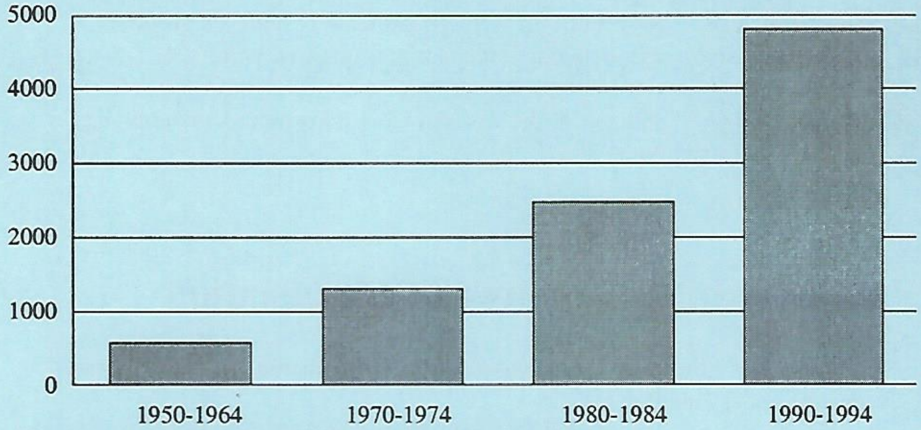
A much clearer pattern is illustrated in Figure 1.2, which shows accelerated expansion in the total number of pages of legislation promulgated each year.

Figure 1.1: **Enactments of primary legislation, selected years, 1960 to 1995 (number of Acts)**



Sources: Institute of Public Affairs Regulation Review Unit and Chamber Research Office estimates

Figure 1.2: Average annual number of pages enacted, 1960 to 1994



Source: Institute of Public Affairs Regulation Review Unit

On average, over the five years from 1980 to 1984, some 2500 pages of legislation were enacted each year for an average of around 170 Acts. However, over the five years from 1990 to 1994, about 4800 pages of legislation were added to the stock of Commonwealth legislation each year, in some 180 Acts.

Although some Acts simplify and reduce procedures for business, much of the new legislation adds to the compliance costs faced by business. If the number of pages per Act is an indicator of the complexity of legislation, then there was a substantial rise in complexity and consequent compliance costs during the last decade. A comparison between the 1960s and the 1990s shows an even more dramatic increase.

The large rise in the number of Acts and their average length suggests an increasing regulatory burden. This is because most Commonwealth legislation affect business—either where the principal purpose is to regulate or where it is an incidental effect.

During 1995-96, 119 Acts were passed by the Federal Parliament. This compares with 164 Acts in 1994-95. Of those passed during 1995–96, 86 were amendments to existing Acts, six were either supply or appropriation in nature, and 27 were other new Acts. Of the new or amended Acts, 33 (28 per cent) can be regarded as having an impact on business. Those with a substantial impact on business are listed in Table 1.2, together with a brief description of their main features.

Most of the 1995–96 Acts were passed in the six months to 31 December 1995. In the first half of 1996, only 24 Acts were passed, a consequence of the Federal election and the ensuing change of government.

In 1995–96, there has been considerable variety in the types of new legislation affecting business. They range from environmental laws to those which regulate the relationship between a firm and its employees.

Over the four years from 1992–93 to 1995–96, 664 Acts were passed by the Commonwealth Parliament. Of these, the ORR estimates that approximately 200 (30 per cent) had an impact on business. Those having a more substantial effect on business have been further categorised in

Figure 1.3, according to their prime purpose, such as environmental, economic or social.

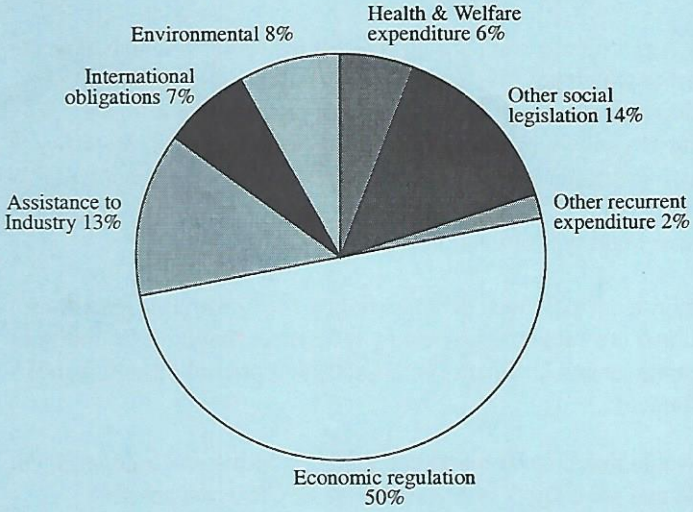
Table 1.2: Selected Commonwealth legislation having a substantial effect on business, 1995–96

Legislation	*Features*
Aircraft Noise Levy Act 1995	Imposes a noise levy on aircraft landings at certain airports.
Bounty Legislation Amendment Act 1995	Continues the fuel ethanol bounty with stricter eligibility criteria.
	Extends the computer bounty until 2000.
Broadcasting Services Amendment Act 1995	Revises current laws designed to protect free-to-air broadcasts of events deemed to be of national significance.
Competition Policy Reform Act 1995	Extends the *Trade Practices Act 1974* to certain government operations and unincorporated businesses.
Customs Tariff Act 1995	Brings Australia's tariff structure into line with the World Customs Organisation.
Dairy Produce Amendment Act 1996	Revise the definitions of market milk and manufacturing milk to allow the established milk payment practices of the Australian dairy industry to continue unchanged.
Education and Training Legislation Amendment Act 1996	Repeals the *Training Guarantee Act 1990* and the *Training Guarantee (Administration) Act 1990* and amends the *Higher Education Funding Act 1988* and the *States Grants (Primary and Secondary Education Assistance) Act 1992.*
Export Market Development Grants Amendment Act (No 1) 1996	Reduces the maximum annual grant for small and medium exporters, and limits the amount by which a claim for grant can be increased between the time of lodgement and its assessment.
First Corporate Law Simplification Act 1995	Applies new disclosure requirements to small businesses for audit purposes.
Hazardous Waste (Regulation of Exports and Imports) Amendment Act 1996	Ensures that Australia can discharge its obligations under international instruments relating to the control of transboundary movements of hazardous wastes
Health and Other Services (Compensation) Act 1995	The cost of medicare services for claimants is to be repaid by compensation payers such as general insurance companies. The administrative cost of the scheme is also to be borne by the compensation payer.

Human Services and Health Legislation Amendment Act (No. 2) 1995	Restricts temporary resident doctors and occupational trainees from participating in Medicare benefits by amending the definition of 'medical practitioner' in the *Health Insurance Act 1973.*
Industrial Relations and Other Legislation Amendment Act 1995	Changes current unfair dismissal legislation under the *Industrial Relations Act 1988.* All applications are to be made in the Australian Industrial Relations Commission. If conciliation fails, the AIRC may conduct consent arbitration if the parties agree. Remedies will only be available once the court considers all the circumstances and not automatically.
Industry Research and Development Amendment Act 1995	Retrospectively validates lapsed guidelines detailing how business can get a tax concession on research and development under the *Industry Research and Development Act 1986.*
National Food Authority Amendment Act 1995	Establishes a joint food standards system in Australia and New Zealand. It seeks to provide the Australian food industry with secure access to the New Zealand market.
Ozone Protection Amendment Act 1995	Extends regulatory control of ozone-depleting substances by establishing a licensing system for hydroflourocarbons and methyl bromide. It bans their export and manufacture, but 'essential uses' will be permitted.
Primary Industries and Energy Legislation Amendment Act (No. 1) 1996	It will return a proportion of the wool tax to woolgrowers, and will enable the wool industry contribution to be made to the Australian Animal Health Council.
Sex Discrimination Amendment Act 1955	Provides employers with a defence of reasonableness against a claim of indirect discrimination. Prevents discrimination against employees who may later bear children.
Superannuation Industry (Supervision) Legislation Amendment Act 1995	Enhances the prudential supervision of the superannuation industry; requires fund trustees to arrange for a qualified auditor to carry out yearly compliance audits.
Sydney Airport Curfew Act 1995	Prohibits take-offs during curfew periods and provides penalties for breaches.
Telecommunications (Carrier Licence Fees) Amendment Act 1996	Increases annual carrier licence fees.
Trademarks Act 1995	Creates a presumption of registrability for a trademark to include sounds and smells.

Source: Office of Regulation Review — based on Parliament of Australia, Senate and House of Representatives Hansard, various

Figure 1.3: Legislation having a substantial effect on business, by type, 1992–93 to 1995–96a



a Excludes Acts relating to levies and taxes, where the primary purpose is to collect revenue.

Source: Office of Regulation Review estimates

Over the last four years, economic regulation was the most significant type of legislation affecting business. Within this category, one of the biggest growth areas has been pro-competitive legislation, which is generally intended to improve economic performance. The statutory implications of the Competition Principles Agreement are just starting to be felt with the passing of the *Competition Policy Reform Act 1995,* and further Acts promoting competition are likely to follow.

Reforms to corporations law over the last four years can also be linked to competition reforms. During 1995-96, the *First Corporate Law Simplification Act 1995* was passed in what will be a series of such Acts designed to further simplify corporations legislation. In part these reforms make firms more competitive by reducing the compliance costs associated with regulations.

The prime purpose of industrial relations legislation can be either economic, or social, depending on the nature of the legislation. In this analysis, it has been grouped under economic regulation. A recent trend in Australia, and in a number of OECD countries, has been to reduce the social component of industrial relations regulation.

Social regulation has been prominent over the past four years, representing around 30 per cent of all new legislation affecting business. Although much of this legislation may not have the principal purpose of regulating business decision-making, it typically has a substantial incidental impact on business.[2]

In summary, there has been a considerable increase in the volume and complexity of Commonwealth primary legislation. This has led to an increase in the stock of regulations, a large proportion of which affects business.

Trends in Commonwealth Subordinate Legislation

Subordinate legislation comprises all rules or instruments which have the force of law but which have been made by an authority to whom Parliament has delegated part of its legislative power. Subordinate legislation is also known by various titles such as regulations, rules, by-laws, statutory instruments, notices, ordinances and proclamations.

There are three main types of subordinate legislation:

- statutory rules which must be approved by the Governor-General in Council and are subject to review by the Senate Standing Committee on Regulations and Ordinances (SSCRO) and possible disallowance by Parliament;
- disallowable instruments which are made by Ministers or government agencies and are subject to review by the SSCRO and possible disallowance by Parliament; and
- other subordinate legislation such as many orders, determinations and by-laws which are not subject to Parliamentary scrutiny.

Reliable statistics on the last of these categories are not compiled.

The volume of new and amended Commonwealth subordinate regulation introduced into the Parliament has continued to expand, as shown in Table 1.3. In 1994–95, the latest year for which data are available, a total of 2087 subordinate instruments were introduced, considerably more than in recent years, although some new instruments repealed outmoded ones.

Table 1.3: Subordinate legislation introduced in the Commonwealth Parliament, 1983-84 to 1994–95

Year	*Statutory rules*	*Disallowable instruments excluding statutory rules*	*Total subordinate legislation subject to parliamentary scrutiny*
1983–84	553	240	793
1984–85	581	501	1 082
1985–86	426	428	854
1986–87	322	510	832
1987–88	345	690	1 035
1988–89	398	954	1 352
1989–90	411	847	1 258
1990–91	484	1 161	1 645
1991–92	531	1 031	1 562
1992–93	408	1 244	1 652
1993–94	490	1 313	1 803
1994–95	419	1 668	2 087

Source: Senate Standing Committee on Regulations and Ordinances (1995)

Statutory rules covered a diverse range of Commonwealth law-making activity. They accounted for 419 or 20 per cent of the total number of new instruments subject to scrutiny by the Parliament.

There was more subordinate legislation for civil aviation than in any other area (715 or 34 per cent). Another important area was that of veterans' entitlements (316 or 15 per cent).

New areas of Commonwealth law under which instruments are beginning to be made include Native Title, where eight such instruments were made in 1994–95. Also of interest is the increasing number of instruments affecting the financial sector, especially in the complex area of superannuation.

Resources of Regulatory Agencies

This section presents an overview of the changes over the past 10 years in resources of 23 Commonwealth and national regulatory agencies. It indicates trends in expenditure and employment patterns of these agencies and draws on the detailed examination of individual agencies in Appendix A.

The 23 agencies selected are among those with the highest level of expenditure on regulatory activities. Most of these agencies have a substantial regulatory impact on business—affecting decision-making either across a broad range of activities (wide scope) and/or to a large extent (high impact).

The level of resources employed by an agency on regulatory activities is clearly only a very crude proxy for the impact of the regulations they administer. Indeed, some agencies with small budgets and/or low staffing can have substantial regulatory impacts. Examples are the Foreign Investment Review Board and the Australian Accounting Standards Board.

In some cases, an agency's functions are not primarily aimed at changing behaviour or outcomes, but they can still have this effect. For example, the main function of the Australian Tax Office (ATO) is to raise revenue, but the imposition of taxes obviously has an impact on business. However, as the regulatory impact of the ATO is inextricably related to its revenue gathering functions, it has not been included in the analysis.

Even where regulatory activities comprise only a small proportion of an agency's total operations, expenditure on regulatory activities can be high. Thus, certain large agencies which are not primarily regulatory in nature have been included. The Reserve Bank of Australia, for example, devotes only approximately 10 per cent of its resources to financial system surveillance, but this still accounts for around $20 million in regulatory expenditure per annum.

The agencies selected have been classified in Table 1.4 into six broad functional categories: trade regulation, finance, consumer protection and competition, environment, health and safety, and communication. The resource figures shown are for the 1994–95 financial year—at the time of finalising this report, final 1995-96 data were not available.

Table 1.4: The resources of Commonwealth and national regulatory agencies, 1994–95

Agency (by category)	*Total staff (number)*	*Total expenditure ($ million)*
Communication	**690**	**59**
Austel[a]		
Australian Broadcasting Authority[a]		
Spectrum Management Agency[a]		
Consumer protection and competition	**307**	**29**
Federal Bureau of Consumer Affairs[a]		
National Competition Council		
Australian Competition and Consumer Commission		
Environment	**194**	**26**
Environment Protection Agency		
Finance	**2264**	**200**
Australian Securities Commission[a]		
Australian Transaction Reports & Analysis Centre		
Insurance & Superannuation Commission		
Reserve Bank of Australia[b]		
Health &/or Safety	**2042**	**253**
Australian Building Codes Board		
Australia New Zealand Food Authority[a,d]		
Australian Maritime Safety Authority[a]		
Civil Aviation Safety Authority[c]		
Federal Office of Road Safety[a]		
National Health & Medical Research Council[a]		
National Occupational Health and Safety Commission		
National Registration Authority for Agricultural and Veterinary Chemicals[a]		
National Road Transport Commission[a]		
Therapeutic Goods Administration[a]		
Trade Regulation	**5892**	**526**
Australian Customs Service		
Australian Quarantine and Inspection Service[a]		

a Also a national standard setting body (see Appendix B).
b Assumed to be the regulatory component of the Reserve Bank of Australia.
c Assumed to be the regulatory component of the Civil Aviation Authority.
d This organisation used to be called the National Food Authority.

Sources: Budget related papers, Annual Reports, and correspondence with agencies

In addition to these categories, a distinction can be drawn between traditional areas of regulation and relatively new areas. Agencies such as the Australian Customs Service, the Australian Quarantine and Inspection Service[3] and the Australian Maritime Safety Authority (AMSA) have been part of the regulatory environment (in one form or another) since federation. They are also among the largest government regulators in terms of resource use. On the other hand, many agencies have been created only in the last 10 years, including the Australian Securities Commission (ASC), the Environment Protection Agency (EPA), the Insurance and Superannuation Commission (ISC), and the National Competition Council (NCC). While many of these new agencies assumed functions of previous organisations, they generally have a broader range of functions.

While budget appropriations to traditional areas have generally decreased, many of these agencies have been able to maintain activities by increasing their rate of cost recovery through fees and charges for certain regulatory activities.[4] However, the most significant growth in regulation expenditure has occurred in sectors of the economy which are only recently experiencing regulation and where cost recovery does not yet play an important role in revenue-raising.

The method of creating regulations differs considerably across the 23 agencies listed. Some create subordinate legislation directly through executive action—such as by the authority of Ministers, Secretaries, or other officials. Other agencies are national standard setting bodies, providing advice on regulations (in their capacity as secretariats) to Ministerial Councils. For example, the Australia New Zealand Food Standards Council considers recommendations made to it by its secretariat, the Australia New Zealand Food Authority (ANZFA—until recently know as the National Food Authority), on draft food standards. Further information on Ministerial Councils and national standard setting bodies is provided in Appendix B.

Some agencies, such as the ASC, are involved in enforcing their own regulations through the imposition of penalties. In contrast, agencies such as ANZFA focus on developing standards, leaving enforcement to State and Territory agencies.

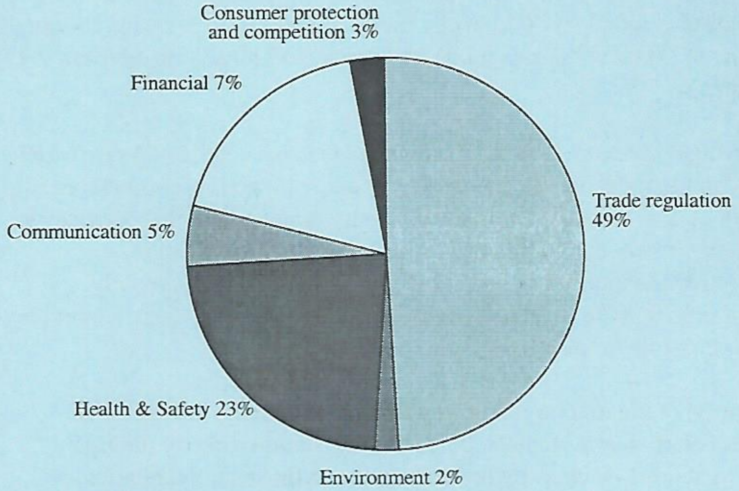
The extent to which an agency is required to enforce its regulations can have implications for the level of resources it needs. Financial regulation is one area where the regulators enforce their own rules and this partly explains the significant increase in resource use over the last decade.

The 23 selected regulatory agencies spent a total of $1100 million in 1994-95 and had approximately 11 500 staff (see Figure 1.5). By comparison, the total number of permanent staff employed in Commonwealth Government departments was around 130 000 in December 1995.

This significantly understates the level of Commonwealth and national resources which are devoted to regulatory activities. If the activities of the ATO and other agencies which affect business were included, as well as the regulatory activities of Commonwealth departments, the estimate for total expenditure on Commonwealth and national regulatory activities would be much higher.

Figure 1.4 shows the level of expenditure by broad function in 1994–95.[5] Although it is clear that the traditional area of trade regulation—customs and quarantine—represents almost half of all Commonwealth regulation expenditure, it involves only two agencies. In contrast, health and safety accounts for around one quarter of all regulatory activity, but there are ten agencies in this class, performing a variety of different safety functions ranging from maritime safety to occupational health and safety.

Figure 1.4: **Share of regulatory expenditure, by broad functions, 1994–95 (per cent)**

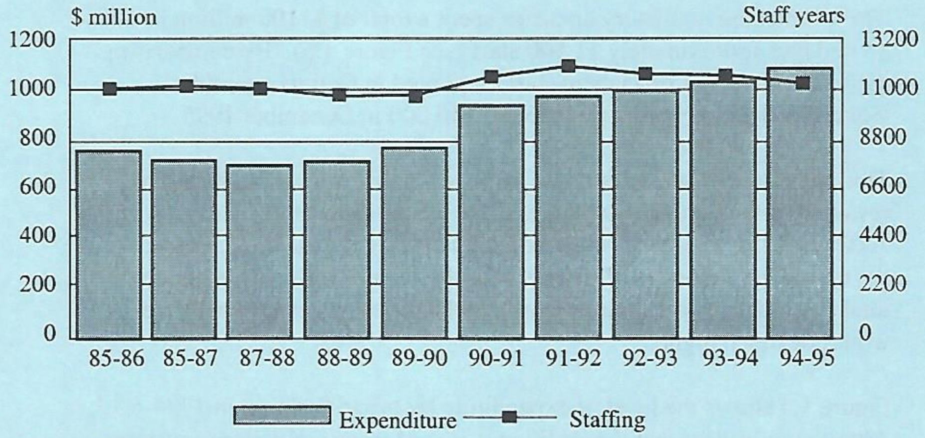


Sources: Budget related papers, Annual Reports, and correspondence with agencies.

Trends in Resource Use

As Figure 1.5 illustrates, there has been a considerable increase in the agencies' aggregate expenditure in real terms over the last decade. Much of this has been funded by increased cost recovery, rather than budget appropriations. In contrast, staffing has remained fairly constant.

Figure 1.5: **Commonwealth and national regulatory agencies: resource trends, 1985–86 to 1994–95 a, b**



a Expressed in terms of 1994–95 prices

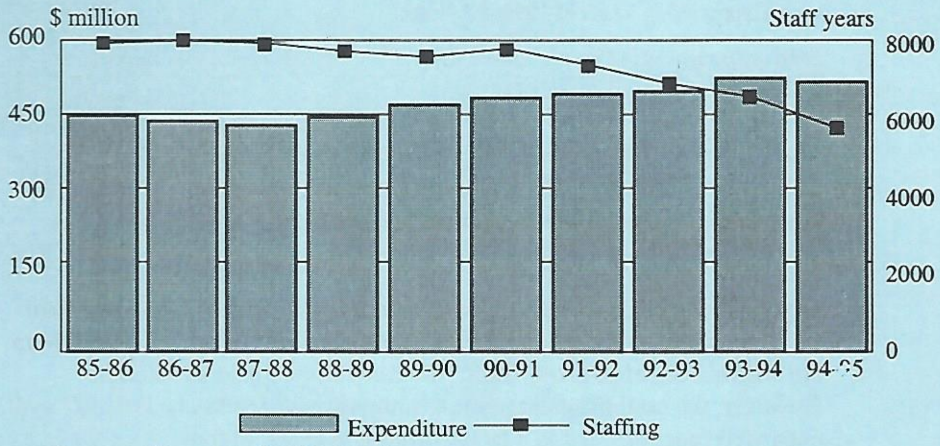
b For certain agencies data were not available for all years. Where figures could not be obtained for an agency in a particular year, resource levels for the following year were assumed to apply.

Sources: Budget related papers, Annual Reports, and correspondence with agencies.

The general trend in aggregate expenditure masks significant changes in resource use for different types of regulation. For example, Figure 1.6 shows that staffing in trade regulation agencies has fallen by 25 per cent since 1985–86. In contrast, expenditure (funded by either budget appropriations or cost recovery) has gradually increased over the decade.

As budget appropriations have fallen, trade regulation agencies have supplemented their income increasingly with revenue obtained through cost recovery. As the increase in cost recovery measures has outstripped the fall in budget appropriations in most years, expenditure generally has increased each year.

Figure 1.6: Trade regulation regulatory agencies: resource trends, 1985–86 to 1994–95[a]



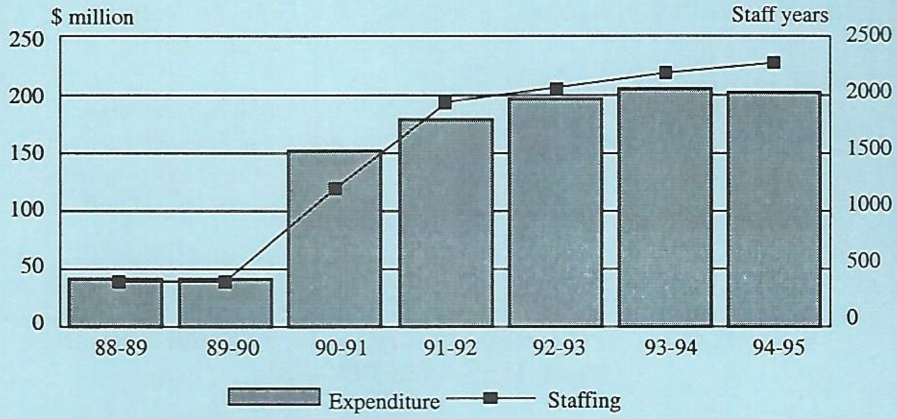
a Expressed in terms of 1994–95 prices.

Sources: Budget related papers, Annual Reports, and correspondence with agencies

While there has been a decline in staffing in the traditional areas of Commonwealth regulation, the reverse has occurred in financial regulation. Figure 1.7 shows resource changes only from 1988–89, since the ISC commenced operations in November 1987.

The significant increase in resource use in financial regulation during 90–91 reflects the establishment of the ASC to administer and enforce the national corporations laws. While the predecessor of the ASC, the National Companies and Securities Commission, merely coordinated State-based regulation, the formation of the ASC led to the transfer of State Corporate regulatory powers to the Commonwealth.

Figure 1.7: **Financial regulatory agencies: resource trends, 1988–89 to 1994–95**[a]



a Expressed in terms of 1994–95 prices.

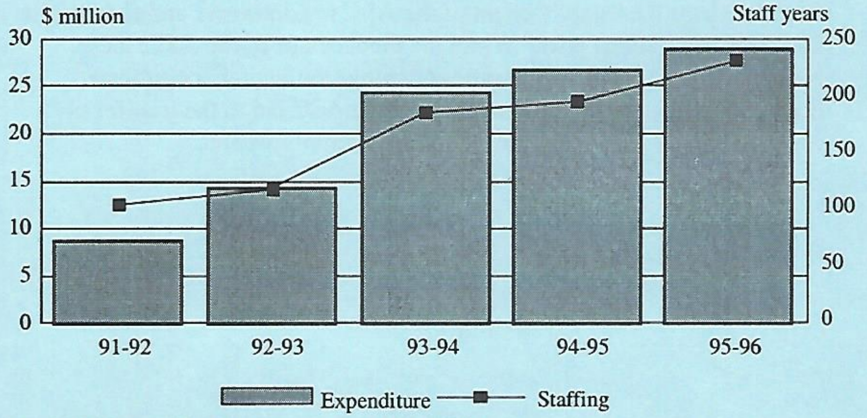
Sources: Budget related papers, Annual Reports, and correspondence with agencies

There has been a big increase also in staffing and expenditure in Commonwealth environmental regulation (see Figure 1.8). However, this may not be indicative of overall trends in environmental regulation as environmental issues are largely a State matter.

Expenditure on environmental regulation remained flat in real terms until 1991–92 with environmental issues comprising only a sub-program within the Department of the Arts, Sport, the Environment and Territories. However, the establishment of the Commonwealth's EPA in 1991–92 with expanded functions, led to a large increase in expenditure.

In contrast, expenditure on consumer protection and competition regulation has increased only gradually, although an expansion occurred in 1995–96 with the formation of the Australian Competition and Consumer Commission. This organisation has a wider mandate than the Trade Practices Commission and the Prices Surveillance Agency which it subsumed.

Figure 1.8: **Commonwealth environmental regulation: resource trends, 1991–92 to 1994–95**[a,b]



a Administered by the Commonwealth's EPA.

b Expressed in terms of 1994-95 prices.

Sources: Budget related papers, Annual Reports, and correspondence with the agency

The NCC—which will review, *inter alia,* anti-competitive regulation and third party access regimes—will play a larger role in competition regulation in the future.

Aggregate expenditure and staffing on regulation of health and safety have not followed clear trends over the decade, largely as a result of the diversity of safety activities within this functional group.

Conclusion

The foregoing examination of the available information on the extent of Commonwealth legislation and regulation indicates that its growth is continuing.

The remainder of this report outlines a range of processes, which—if effective—will ensure that regulations meet certain quality assurance guidelines, thereby helping to achieve the goal of minimum effective regulation.

End notes

1 For example, with submissions to the Commonwealth Cabinet, the impact on business is the trigger mechanism for conducting regulatory impact analysis (a Regulation Impact Statement), however the analysis itself covers significant impacts on all groups and on the community as a whole.

2 Refer to ORR (1993, p. 20) for further details about the economic impacts of social regulation.

3 AQIS has been classified as a 'trade regulation' agency as it regulates product imported to, or exported from, Australia. It is recognised that the activities could have also been classified as 'health and safety'.

4 Refer to ORR (1995, pp. 22–28) for further discussion of issues relating to cost recovery.

5 Expenditure can be financed by either cost recovery or budget appropriations.

Source: Industry Commission, *Regulation and its Review 1995–96*, AGPS, Canberra, 1996, pp. 1–18.

Competition policy and deregulation

Topic 11

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Introduction

This topic provides the theoretical background on the competitive process, and introduces you to the general area of competition policy. In analysing competition policy we will consider the issues surrounding restrictive trade practices.

In several previous topics in this unit you have considered many of the factors which help determine the structure of markets and the behaviour of firms operating therein. It has been pointed out that while some kinds of business conduct may be welfare-enhancing from the perspective of consumers generally, other aspects of business behaviour can be detrimental to overall consumer welfare (even though they may well be quite profitable for the firm itself!). We will now examine government policy aimed at controlling this form of conduct.

We will also consider the appropriate role for deregulation and privatisation in a modern market system.

Open the business pages of a major Australian daily newspaper and you will often see some discussion of, or report on, a press release from the Australian Competition and Consumer Commission (ACCC). The prominence given to the ACCC in the Australian media is a reflection of the importance given to this organisation by Australian business decision makers.

The current chair of the ACCC is Professor Allan Fels. Most of you will have heard of Allan Fels—but how many of you can nominate the permanent head of the Federal Treasury? Why is the public servant who runs the ACCC so much better known than the public servant who runs the Treasury?

Firms realise that the success of their merger proposal or, alternatively, their ability to defend a hostile takeover, may depend on the interpretation the ACCC, and then the courts place, on the cases. In some sectors there are industry specific regulators such as AUSTEL in the telecommunications industry and the Office of the Regulator General controlling pricing and competitive practices in privatised industries. In their particular industries, these organisations tend to play an even more intrusive role than the ACCC does in controlling the behaviour of industry in general.

Good strategic decision making necessitates a sound understanding of the objectives and strategies of these regulators. It also involves some grasp of the general policy direction these regulators are heading.

Objectives

At the end of this topic you should be able to:

- distinguish between the business executive's and the economist's concept of competition;
- outline the crucial role played by barriers to entry in determining how competitive a market is in practice;

- identify the key theoretical dimensions of a market;
- assess the arguments put forward to justify government intervention in order to achieve competitive behaviour in markets.
- explain the Australian Competition and Consumer Commission's approach to the assessment of anti-competitive practices and the relevance of contestability to this approach;
- explain the rationale for privatisation and deregulation; and,
- analyse particular privatisation and deregulation proposals and comment upon their economic disability.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 18 and 19.

Readings

Reading 11.1
Australian Trade Practices Reports
'Re Queensland Co-operative Milling Association Ltd, Defiance Holdings Ltd (Proposed Mergers with Barnes Milling Ltd) (1976)'

Reading 11.2
Australian Trade Practices Reports
'Arnotts Limited and Ors v. Trade Practices Commission (1990)'

Reading 11.3
Bureau of Industry Economics
'Mergers and acquisitions'

Reading 11.4
R. Fraser
'Privatisation in the United Kingdom: Lessons for Australia'

Reading 11.5
R.L. Miller & R.P.H. Fisher
'Privatisation of prisons'

Why regulate for competition?

In a first-best world, the self-interests of firms and the countervailing pressures of consumers would be sufficient to ensure that the competitive process worked to achieve both productive and allocative efficiency, as well as dynamic efficiency (innovation and responsiveness to changing institutional factors and changing consumer wishes). In other words, the competitive process would prevail and social welfare would be maximised. In reality, however, there exist many different kinds of impediments to the achievement of this economic nirvana. In Topic 10 we saw that these impediments result in what economists call market failure. When market failure exists, the in-built self-correcting forces of the competitive process are either shackled or non-existent, such that achievement of the social optimum cannot be reached without government intervention into the relevant market. Where market failures exist in the form of imperfect information about prices and product quality and/or rent seeking behaviour by firms with market power, we have a necessary but not sufficient condition for government intervention. There is no one approach to dealing with these problems when they develop. It is a matter of case by case assessment of the problem and the circumstances in which it occurs, and we know that different governments often take very different approaches to dealing with these problems.

☐ *Read the introduction to Chapter 18 and Section 18-1 in Begg et al. (2000), pp. 293–7, concerning the economic case for government competition policy.*

'Hands-on' and 'hands-off' philosophies on regulation

While there is a danger in attempting to classify economists' attitudes towards government intervention in markets, we can probably identify two broad schools of thought—what can be called the 'hands-on' and the 'hands-off' philosophies. You should be aware that within each group there exist several different levels of support for the extent to which that particular philosophy should be put into effect.

- The 'hands-on' approach essentially reflects the view that, because of the inevitable presence of market failure of one type or another, markets in general will not work optimally if they are not regulated and that society will therefore suffer if markets are left to themselves. This approach believes that an interventionary framework is necessary which establishes what is socially acceptable in terms of corporate behaviour, and which sets up an interventionary mechanism which can be invoked should firm conduct be thought to be potentially in breach of the law. Note that this approach does not suggest the automatic need for, or the desirability of, continued or regular intervention as a matter of course, but rather suggests that certain rules of the game need to be spelled out and that a referee needs to be empowered to handle alleged infractions of the set rules.

- In contrast, the 'hands-off' school of thought argues that either market failure often cannot be corrected in a cost effective manner or that many forms of market failure are only a temporary phenomenon which will be corrected by the unhindered pursuit of self-interest by the various parties operating in the market. Indeed, many economists now argue that government intervention itself is the chief cause of long-term market failure and that the only real entry barriers into a market are government-imposed ones like licences.

There is, of course, no single correct economic answer to the question of whether governments should intervene in markets or not—it is a matter for professional judgment on a case by case basis.

The two different perspectives on government intervention come in part from differences in the perceived consequences of regulatory intervention. Analysts that tend towards the 'hands-off' approach are more likely to be concerned with the private costs of the regulatory process and with its effect on economic efficiency, while supporters of the 'hands-on' school are more likely to focus on the social costs of market failure.

Think about your preferred position with respect to some prominent issue concerning regulation which is topical at the time of reading these notes. Is more or less regulation needed? Why? Of what type, if more is called for? If you believe less is needed, how would you cut back on regulatory intervention? In each case, can you identify the gainers and the losers? How? How accurately can you identify the dollar value of these gains and losses?

A key objective of this topic is to understand why governments implement the regulatory policies they do. To achieve this we need to be clear about what is meant by competition and how it can be measured in a practical sense. These are the focuses of the next two sections of this topic. The next section outlines a definition of competition in terms of a market while the following section looks critically at how we can make that definition operational by defining a meaningful market.

The concept of competition

Most economists believe that the appropriate way in which to achieve optimum consumer welfare in markets is through the proper functioning of the competitive process. However, the competitive process which we seek to protect and develop in real world markets is not quite the same thing as the model of perfect competition which you have considered earlier in this unit. Indeed, it is far from it, but you have seen the sorts of conditions which economists think are indicative of well-functioning markets, and you have also been exposed to those types of market structure which can result in a variety of anti-competitive practices being pursued by firms. In this topic, we consider what competition means in practice to business executives. We will then contrast these views to those of economists, in the process differentiating between economists' views of competition as a process, and the static elementary textbook notion of a perfectly competitive market structure.

In earlier topics you have learned a lot, hopefully, about how markets work, but you have not yet been exposed to the methodology used by economists to delineate the boundaries of markets in practice. You have simply been asked to assume, perhaps implicitly, that a market is a group of buyers and sellers interacting with each other. In practice, as we shall see in this topic, it is not easy to define with any precision exactly which buyers and which sellers should be included in any particular market. Why is this such a big deal, you may well ask? The answer is simple—competition can be properly analysed only in the context of a market, so it is essential to define the market properly to start with (although, as you will discover, all too often market definition has tended to become an end in itself rather than as the means to the end of evaluating how well the competitive process is working).

It is assumed in this topic that government competition policy has, as its goal, the achievement of the best level of market performance consistent with any known institutional, resource or budgetary constraints, and that any regulatory intervention will be in the public interest. In other words, the aim of competition policy is to maximise social or public welfare. However, there will inevitably be conflict between firms and government competition authorities like the ACCC, who more often than not will see any given 'problem' from two quite different points of view.

Before reading on, briefly outline what you understand to be the nature and role of the competitive process. (You will need your definition for comparison purposes later.)

The executive's concept of competition

Charles Revlon, founder of the Revlon cosmetics empire, is reported to have once said: 'I don't meet competition. I crush it'. Such a business philosophy typifies the attitude which many executives have to competition. Competition is seen as a means to an end, where the end is seen as the development or enhancement of a position of market power, obtaining a very large share of the market, and not having to worry too much about what is being done by rival firms.

The strategies which executives implement to achieve such goals can include (this list is by no means exhaustive):

- aggressive pricing policies, perhaps including predatory pricing;
- product differentiation and large-scale advertising campaigns;
- the development of new products and new production techniques;
- vigorous attempts to make it difficult for current rivals to compete on the same footing, and strategies developed to block successful new entry into the market;
- vertical integration, especially in order to tie up the supplies of an essential input or to gain sole access to what is known as an essential facility;
- exclusive dealing, in which the firm pressures its retailers not to sell the products of rival manufacturers;
- the entering into of long term contracts with customers in order to shut rivals out.

Economists regard many of these commercial strategies as being at least potentially anti-competitive, depending on the circumstances surrounding their implementation.

The economist's concept of competition

Economists applaud good, hard commercial rivalry based on superior efficiency, better research and development, more realistic profit margins and so on. They decry the misuse of market power in which commercial dirty tricks are used to force out of a market a rival which had the potential otherwise to improve the standard of competition in the market. In other words, competition is seen as being at the opposite end of the spectrum to a misuse of market power. The one is the very antithesis of the other. Unfortunately, however, there is no clear dividing line between these two extremes of market behaviour. Whether a market is judged by economists to be competitive in practice will depend on many factors, and on the relative weights ascribed to the contribution of each of these factors to the competitive process.

Competition as a process

A competitive market is one where all firms make their own independent pricing, output and product strategy decisions, free from collusion with rivals or from coercion from larger rivals. This approach emphasises that competition is a dynamic process of interactive rivalry between firms. Competition should not be seen in the purely static structural context of the model of the particular type of market structure known as perfect competition.

While there is general agreement that competition is a dynamic process of interactive rivalry, it must be admitted that the process of competition is such a complex phenomenon that a single, objective, operational definition of it cannot be developed. There has been a tendency to use various measures of aspects of market structure (such as concentration and barriers to entry) as an empirical, objectively-measurable proxy for identifying a competitive market. We shall see shortly that it is unlikely that a market with high barriers to entry will be competitive. Nevertheless, it must be pointed out that care is necessary if any static structural measure is to be used as an indicator of the extent to which the competitive process is functioning successfully in any given market.

Structure provides the framework within which competition may or may not take place. A competitive market is characterised by persistent renewals of rival initiatives, which are a function of managerial perceptions and attitudes.

Two different markets with the same number of firms can exhibit markedly different types of firm conduct, depending on, for example:

- whether the products of rival firms are differentiated or not;
- the attitudes of management;
- the extent to which the firms are diversified;
- the rate of growth of market demand and the inherent institutional features of the market;
- the presence, or threat, of imports;
- the time period under consideration.

Consider the Australian airline market post deregulation. With just two operators on the trunk routes, the market appears to be intensely competitive—much more so than, say, the whitegoods market, which also has three major players. In other words, you should be wary of making hasty judgments about the extent of competition in a market based solely on a consideration of the number of firms operating in the market.

Characteristics of a competitive market

By far the most influential statement in Australia as to what constitutes a competitive market has been provided by the Trade Practices Tribunal (TPT), a quasi-legal body established to hear appeals against certain decisions of the ACCC (then Trade Practices Commission), the antitrust enforcement agency in Australia. The TPT argued forcefully, in an influential decision widely accepted in Australian policy circles, that competition should be regarded as a process rather than as a static structural situation.

☐ *Now read Reading 11.1 to discover what the Tribunal's position was on the definition of competition.*

How would you summarise the Tribunal's view?

There are several important points to note from the Tribunal's decision:

- it emphasises that competitive markets do not stand still, and that firms which choose to ignore the forces at work in a competitive market cannot expect to survive;
- a competitive market will exhibit independent rivalry by firms in both price and non-price dimensions;
- it stresses the crucial role played by barriers to entry in determining the extent to which competitive conduct will be found in a market.

Note that while the TPT emphasised that competition is related to market structure, it did not give prominence to a consideration of market shares. Its emphasis was on those aspects of structure like entry conditions and inter-firm arrangements, which in reality are typical of the behavioural factors which underpin the notion of competition as a process.

The effect of barriers to entry or contestability

Of course, broad conceptualisations of such a diverse concept as competition do not provide a simple checklist of factors to look for in any given market. Each market must be assessed on its own set of facts. However, it is not disputed by any economist that the most crucial determinant of the level of competition in a market is the condition of entry—in other words, how threatened do the incumbent firms feel by the entry of new firms, either in the form of:

- a new firm starting up;
- a firm already in operation in another geographic area producing a similar product, or a firm which has the ability to switch production from its current line(s) to the product in question; or
- an overseas firm competing in the form of sending imports into Australia.

You will recall the concept of contestability from Topic 9 on imperfect competition. A contestable market then is one 'characterised by free entry and free exit' (Begg et al. 2000, p. 158).

The TPT's notion of the set of conditions that would constitute an effectively competitive market are essentially the same as those that an economist would put forward to explain a contestable market. While the term contestability did not gain prominence in the economic and industrial law literature until the early 1980s, much of the earlier work can be re-interpreted in terms of contestability. It is potential competition that is stressed rather than actual numbers of firms operating in a market at any point in time, and crucial importance is placed on the extent of barriers to entry into the market place.

☐ *You might benefit from quickly glancing back to Begg et al. (2000), Chapter 10, pp. 158–62, to refresh your memory on contestability.*

You should note carefully here that, from the point of view of the effect of entry on competition, it is relevant to ask whether there exist barriers to commercially successful entry, or what might be called barriers to survival. Entry may be easy, in an absolute sense, but established firms may be so entrenched, with strong brand names, access to the best inputs and the like, that small fringe firms are continually entering and leaving, without posing any real competitive threat to the incumbents and without the incumbents having to make any changes to their commercial strategies in response to the new entrants. In other words, a simple consideration of the structural condition of entry is not enough.

What need to be considered are the dynamic effects of entry over time, and the impact of threatened entry on the plans of the incumbent firms. It is all very well to assert that there exists one or more potential entrants to a market, but unless their entry is so imminent, or so likely that the incumbents have made commercial contingency plans to deal with the threatened new rival, it is not appropriate to consider the incumbents constrained by the threat of entry. The big advantage of new entry is that it threatens to break up established market conditions, and forces a re-assessment of strategic behaviour—in other words, new initiatives and counter-responses have to be developed, and a fresh impetus given to the competitive process.

However, you should be wary of concluding automatically that no signs of either actual entry in the past, or the lack of a queue of identifiable future potential entrants, mean that the incumbent firms in the market have been acting in an anti-competitive manner. Lack of entry may be signs of vice rather than virtue—it may be that the incumbent firms' conduct is so responsive to market supply and demand conditions that no entrant can see a profitable opportunity in the market, in terms of all elements of the price-product-service package.

It has been implicit in our discussion so far that what constitutes a barrier to entry is unambiguous and easily identifiable and quantifiable in practice. Unfortunately, there is quite a debate amongst economists as to just what constitutes an entry barrier, in both theory and practice.

- One approach argues that an entry barrier is any disadvantage, real or perceived, faced by a potential entrant in comparison to an incumbent firm, such that the incumbent can raise price above minimum average cost without attracting entry.
- A much more restrictive definition holds that an entry barrier is present when there exists a cost asymmetry between the potential entrant and the incumbent firms. Or in other words, a barrier exists when the potential entrant has to bear a cost which is not borne by firms already in the market, as far as current decision-making is concerned (for example, higher environmental standards applied to new factories and not to established ones).

Under the second definition the need to secure a government licence (the supply of which is limited) to operate, and the presence of what economists call sunk costs would be held to constitute entry barriers. A sunk cost is one which, once incurred, cannot be retrieved; for example, the expenditure outlaid on a piece of capital equipment or infrastructure that has no resale value.

There is, however, agreement between the various schools of thought as to the effect of barriers to entry; they increase the market power of incumbent firms (where market power is defined as the ability to act in an unconstrained way, or in a way which would not be possible in a competitive market) such that market performance will be less than socially optimal.

You may have come across the notion of *contestable markets*—ones which behave in the public interest, where entry is what has been called 'ultra-free' (there are no exit costs, short of the usual user costs like depreciation) and where entry can be instantaneous after an incumbent firm has acted in such a way as to entice new entrants in search of the pure economic profits being earned. A complete absence of sunk costs is necessary for a perfectly contestable market to exist, and instantaneous reactions are rarely possible. It is suggested that very few, if any, perfectly contestable markets exist in the real world, even where imports are freely available, because of time lags in sourcing imports, and because of the entrenched brand preferences usually held by consumers for the products of the incumbent firms. The relevant policy issue is to determine the degree of contestability of a particular market rather than whether the market is perfectly contestable or not.

Competition and the commercial survival of competitors

The role of competition policy, more specifically of antitrust legislation and enforcement, is to encourage the development and enhancement of competitive markets via the promotion of independent and hard, but fair, business rivalry, while at the same time ensuring that the strategies employed by firms are not predatory or do not in any other way represent a misuse of market power.

However, you should not interpret this to mean that competitors should be protected from their own inefficiencies or inabilities, or from fair and vigorous competition by rivals better able to respond to market pressures. The TPC said some years ago (in 1978) in its Fourth Annual Report (p. 3) that:

> Competition is not painless. Any attempt to make it so must necessarily destroy it. It is the function of competition in an industry to serve the community at the expense of individual competitors. When there are complaints about [fair] competition, there is proof that it is effective.

Review your definition of the 'competitive process' completed earlier in this section. Does it need modification?

In summary, there is no one simple all-embracing operationally useful definition of what constitutes competition in any given market. Just as beauty lies in the eye of the beholder, so too does the assessment of whether any particular market is competitive or not. There are so many variables to consider, and the weights to be attached to each will differ so much according to the subjective evaluation of the observer, that it should not be surprising that economists can differ greatly in their assessments of the extent of competition in a market. Because of this, it is important that the basis for one's conclusions about competition in a market should always be fully spelled out. Of course, in the adversarial context of court proceedings, you could expect strongly opposing views as a matter of course, but even in the context of disinterested evaluation, say for academic purposes, there can be great differences in opinions as to how competitive a market might be.

Question 11.1

(a) How easy is it to identify potential competitors for any given market? What distinguishing features would you look for, either as an outside observer or from the point of view of an incumbent firm?

(b) Identify potential competitors for firms in the following Australian markets:

- ***(i) whitegoods manufacturing***
- ***(ii) wine bottles***
- ***(iii) Elvis Presley albums***
- ***(iv) computer software***
- ***(v) automotive parts and accessories***

(c) A problem in many antitrust cases relating to competition is that some particular observed conduct in a market, for example, a simultaneous increase in prices by rival firms, may be consistent with both innocent as well as anti-competitive behaviour by the firms. Under what circumstances might this phenomenon happen? How would you deal with it, from a regulatory point of view?

As a final thought for this section, ask yourself whether your organisation has initiated any commercial strategies towards rivals, potential rivals or customers which could be regarded by these entities, or by outsiders such as economists, the ACCC or the courts (!), as being at least potentially anti-competitive. (If this question is not relevant to you because you work in a non-commercial environment like the public service, then you might like to try and recall some business strategies you have heard or read about, or have otherwise been exposed to.)

Obviously, we cannot provide you with a specific written answer to this particular exercise. But it can be pointed out that you should always keep in mind the possibility that what seems to your firm, or to you as an executive, as nothing other than good, hard, aggressive competition may appear to be predatory or anti-competitive conduct to an impartial observer. Keep this potential problem in mind as you study this topic. At the end, ask yourself whether there are any of your business practices about which you previously had no doubts, but about which you might now have some reservations, at least about their potential to be anti-competitive. Of course, if you are a risk lover, and if the conduct in question has proved to be profitable for your firm, you may decide to take a chance and continue with it. While we certainly would not advocate taking such a gamble, we shall point out later in this topic that, from a purely monetary expected value perspective, a firm could decide to persist with what could be called a rational contravention of the law.

The concept of a market

We have explored the concept of a market and market system earlier in Topic 8. We return to it here in the context of competition.

Competition and markets

We have stressed how important it is for business executives to understand the nature of the competitive process. It is also crucial to understand that competition takes place within the context of a market.

Therefore, it is essential that the market be carefully defined before any attempt is made to analyse the extent of competition between the firms operating therein. But here we strike a definitional problem—a market can be defined, simply, as a group of closely competitive firms. In other words, the concepts of competition and market are by definition intertwined. In practice, the two are inseparable. Why, then, you might well ask, have we chosen to discuss these two concepts separately in this topic?

We do so only in order to present more clearly the various dimensions of a market. Do not let this approach lead you to think that market definition is an end in itself. It is not; rather, it is a means to the end of evaluating the extent of competition between a group of firms. Nevertheless, in practice, the usual procedure is to identify the boundaries of the market first, keeping in mind the problem at hand, and then proceed to assess how competitive that market is. As we shall see, the courts in Australia have adopted this approach, as has also been the case overseas, although this has sometimes led to considerable (and perhaps unnecessary) economic testimony and debate, which together have tended sometimes to obscure the main market facts.

Such problems have resulted in one well-known American economist, Franklin Fisher (1979), arguing that whether firms behave competitively or not does not depend on the formal definition provided of the market by an economist—obviously, the market exists as a matter of fact and commercial reality, and nothing the economist, lawyer or judge says can alter that—but rather depends on whether there exist any real constraints on a firm's ability to exercise market power. As he says, the fundamental or real question is not what is the relevant market, but rather what are the constraints on the firm or group of firms in question.

Fisher's approach has been endorsed by the High Court in the Queensland Wire case (QWI), where Dawson J. cautioned (Australian Trade Practices Reports 1989, p. 50,015) that 'Too rigid an approach in finding a market is apt to lead to unrealistic results' and Deane J. warned (at p. 50,012) that '... there will ordinarily be little point in attempting to define relevant markets without first identifying precisely what it is that is said to have been done in contravention...' You should also bear in mind the observations of Mason C.J. and Wilson J. (at p. 50,008):

> In identifying the relevant market, it must be borne in mind that the object is to discover the degree of the defendant's market power. Defining the market and evaluating the degree of power in that market are part of the same process, and it is for the sake of simplicity of analysis that the two are separated ... After identifying the

appropriate product level, it is necessary to describe accurately the parameters of the market in which the defendant's product competes: too narrow a description of the market will create the appearance of more market power than in fact exists; too broad a description will create the appearance of less market power than there is.

☐ *Now read Reading 11.2, from which you will gain an introduction to the purpose of market definition, as well as some of the pitfalls waiting for the unwary in this process. Keep these issues in mind as we turn next to look at the formal methodologies which have been developed as an aid in market definition.*

Question 11.2

From the reading, explain how Fisher (1979) would assess the existence of monopoly power?

Market definition

A market may be defined as a group of firms selling close substitute products to a common group of buyers. This deceptively simple definition leads to considerable difficulties when we turn empirically to delineate the boundaries of a market—so much so that one very prominent American antitrust expert has said with uncharacteristic bluntness that 'this whole area is a bloody mess'!

One thing about which you must be clear is the difference between the concepts of market and industry. There is a tendency to use the two terms interchangeably both in textbooks and in practice, but it must be recognised that the two are conceptually quite distinct. As we have broadly defined it, a market is an area of close competition between rival firms. It is analytically distinguishable from the concept of an industry.

An industry is defined on the production side, and includes those firms producing similar products or using similar production processes. Conceptually, a market is broader than an industry, as the market includes not just the sellers but the buyers of the product as well. Geographically, however, a market could be more confined than the industry with which it is associated.

For example, while we can validly define the Australian bread industry in terms of those producers which manufacture breads (and perhaps other yeast-based goods) with certain recognisable product characteristics and which use certain production processes, not all bread manufacturers in Australia are in close competition with each other and therefore do not operate in the same market. Bakers in Townsville do not compete with bakers in Perth, as each group is selling to quite distinct sets of customers. There is in fact a whole series of analytically distinct bread markets in Australia, and the pattern of competition could be quite different in each, depending on the identity and the number of sellers in each market, the number and identity of buyers, the extent of entry barriers in each market, and the way in which buyers and sellers interact, both within and between each group of participants in the market.

The *Trade Practices Act*, in Section 4E, provides a working definition of what constitutes a market as follows:

> For the purposes of this Act, unless the contrary intention appears, 'market' means a market in Australia and, when used in relation to any goods or services, includes a market for those goods or services and other goods or services that are substitutable for, or otherwise competitive with, the first-mentioned goods or services.

Note that this definition does not exclude the output of potential competitors from being included in the market, nor does it exclude a consideration of imports from overseas suppliers. Indeed, in the QWI case in the High Court, two separate judgments found that a market can exist if there exists merely the potential for close competition, even though no competition in fact currently exists. In addition, a market will continue to exist even though transactions in it might be temporarily suspended.

The first comprehensive statement on the principles of market definition was provided by the Trade Practices Tribunal (TPT) in the *Queensland Co-operative Milling Association (QCMA)* case (see Reading 11.1). The passage which follows from that case has been referred to, with approval, in a large number of Federal Court judgments, and more importantly, in the QWI judgment by the High Court. In the QCMA decision, the Tribunal provided the following approach to market definition (Australian Trade Practices Reports 1976, p. 17,247):

> A market is the area of close competition between firms or, putting it a little differently, the field of rivalry between them ... Within the bounds of a market there is substitution—substitution between one product and another, and between one source of supply and another, in response to changing prices. So a market is the field of actual and potential transactions between buyers and sellers amongst whom there can be strong substitution, at least in the long run, if given a sufficient price incentive. Let us suppose that the price of one supplier goes up. Then on the demand side buyers may switch their patronage from this firm's product to another, or from this geographic source of supply to another. As well, on the supply side, sellers can adjust their production plans, substituting one product for another in their output mix, or substituting one geographic source of supply for another. Whether such substitution is feasible or likely depends ultimately on customer attitudes, technology, distance, and cost and price incentives.
>
> It is the possibilities of such substitution which set the limits upon a firm's ability to 'give less and charge more'. Accordingly, in determining the outer boundaries of the market we ask a quite simple but fundamental question: If the firm were to 'give less and charge more' would there be, to put the matter colloquially, much of a reaction? And if so, from whom? In the language of economists, the question is this: From which products and which activities could we expect a relatively high demand or supply response to price change, i.e. a relatively high cross-elasticity of demand or cross-elasticity of supply?

It should by now be clear to you that a market is defined empirically in terms of both actual and potential substitution possibilities in both demand and supply, in response to a price change. Recognition of this has led to a lot of theoretical posturing by economists in court, especially with respect to potential supply-side substitution possibilities, leading one Australian judge to declare that 'The proper definition of a market is entirely a matter of fact ...', and also that '... the best evidence of the dimensions of the relevant market may be the behaviour of people in the particular trade ...' n other words, it is important to ensure that the concept of substitutability does not get taken to the extreme of all conceivable theoretical possibilities, no matter how distant they are from reality.

Thus, when demand or supply responses to an hypothesised price change are being considered, it will not be relevant to assume a price variation which was larger than that which would normally occur as a matter of commercial reality for the particular product or group of products under review.

Hence, when seeking to define a market, it is advisable to consider only the actions or reactions of players in the market which would be likely to occur in practice—it does not help to broaden the market definition by referring to substitution possibilities which, while theoretically possible, appear unlikely to have any practical significance.

One way to delineate a market's boundaries which has been used in both Australian and American cases, is to consider the nature and extent of the constraints operating on the firm(s) whose conduct is at issue, from the point of view of that firm. That is, let the firm's actions and perceptions define the market. This approach is based on the assumption that the firm in question (and others in the market such as rivals and buyers) are in the best position to know what the market is, and that their actions will define that market. Such an approach also lends itself to the collection of the economic evidence necessary in cases relating to competition.

A final comment

We have provided you with no single magic formula to help you define market boundaries. Many have tried to provide a universal formula, but it is fair to say that all have failed. Several of the references listed at the end of this topic, notably Schrank and Roy (1991), Shughart (1990), Martin (1988) and Scherer and Ross (1990) provide you with a more detailed critique of the various approaches than has been possible here. In the Australasian context, you should read Brunt (1990) and Norman and Williams (1983), together with the various issues of the ACCC's Annual Report, if you would like to pursue this issue in greater depth.

It is best to conclude this section with the acknowledgment that a market is specific to the particular product(s) and geographic region(s) of interest, as well as being specific to the practical economic question(s) being asked. In other words, market boundaries are a matter of fact and commercial common sense.

Question 11.3

Does it make sense to talk about an Australian market for goods and services like motor vehicles, computers, gold, insurance and academics? What implications does your answer have for the control of mergers in the traded goods and services sectors of the economy?

Question 11.4

Should market definition allow for the presence of second hand products? Consider in relation to both the supply and demand side of the market.

Question 11.5

'Synthetic' petrol is made by a single firm in New Zealand from natural gas. It can be used directly as unleaded petrol but is also used at the

refinery as a blendstock in producing leaded petrol. Within what market does this producer operate?

In this and the previous sections we looked at why competition is of concern to governments, what constitutes competition, and how one would measure the extent of competition in any market. We now conclude this topic by looking at antitrust legislation and privitisation and deregulation as examples of pro-competitive public policies.

☐ *Read Section 18-4 in Begg et al. (2000), pp. 302–5, for some background on the UK situation with respect to competition policy and deregulation. Compare the UK and European experience with the Australian case.*

Antitrust legislation and enforcement

Antitrust is a particular form of government intervention, albeit somewhat different from the rather more direct forms of public regulation such as price-capping, licensure, and output controls. The latter types of regulation usually necessitate an on-going, close-quarters relationship between regulator and regulatee as market conditions change. In contrast, antitrust is rather more episodic—as Scherer and Ross (1990, p. 12) note colourfully, 'more like surgical intervention than the steady administration of medicine to treat a chronic disease.'

Antitrust basically involves the proscription of certain types of economic activity in markets which are thought likely to result in anti-competitive outcomes. As you will see in the next topic, antitrust focuses on a variety of such activities:

- horizontal firm practices (like collusion on prices and market sharing agreements);
- primary and secondary boycotts;
- vertical practices imposed from one functional market level to another (like exclusive dealing, resale price maintenance and price discrimination);
- misuse of market power through conduct such as predatory pricing and strategic entry-deterring behaviour; and
- mergers which have the potential to cause significant anti-competitive detriment.

These practices can be made either illegal per se (that is, they cannot be justified by the offending firm(s) under any circumstances), or they can be dealt with under the so-called rule of reason approach, in which the alleged offence is considered on its merits in the light of all of the surrounding circumstances.

Of course, in an ideal world the ultimate aim of antitrust would be to be non-interventionary—to have set up the competitive process in markets so well and to have instilled so effectively in executives the need to act in a competitive manner at all times, that there would be no need for intervention. A pipe-dream, to be sure, but what this is meant to convey is the fact that antitrust intervention aims to make markets more inherently competitive so that they could in fact become self-regulating. The simple fact that legislation exists and that an enforcement authority could be brought into action would constitute the ultimate deterrent to anti-competitive behaviour.

In other words, we have the paradox that in order to have competitive markets, at the very least the threat of intervention by an antitrust authority like the ACCC is necessary. It could be argued that the existence of imperfect information, changing institutional factors, strategic decision-making by firms, and unpredictability of judicial decisions, amongst other things, all mean that an active antitrust stance by the appropriate authority may be needed in order to ensure the continued good health of the competitive process in society.

☐ *Reading 11.3 provides some background to the extent of merger and takeover activity in Australia. It also summarises BIE's view on the major policy issues associated with anti-trust regulation.*

What conclusions did the BIE in 1990 draw on the impact of mergers and takeovers on efficiency and market power?

So far we have drawn your attention to the possibilities for abuse of market power by private firms. Abuse of power is not peculiar to the private sector. As Albon (1986, p. 7) points out:

> … there are various problems inherent in the 'public enterprise' mode of operation, especially where there is also an element of statutory monopoly. Monopoly power exists in many cases including telecommunications, postal services, electricity and tertiary education. Often this monopoly power appears to have been exploited to the benefit of management, unions, equipment suppliers, favoured customers, regulators and politicians; and to the detriment of customers in general. Regulatory discipline has failed and the alternative disciplines of private ownership and the market are well worth considering.

This now leads us to the consideration of privatisation as a public policy instrument..

Privatisation and deregulation

Privatisation and deregulation can be confusing terms; let us begin by clarifying them. *Deregulation* is concerned with the process of replacing bureaucratic controls with market forces, regardless of whether that regulation is public or private. Given that public ownership is probably the ultimate form of public regulation, *privatisation* can be viewed as a form of deregulation. It involves deregulation through the sale of public assets to private interests.

Privatisation can take several forms (see Butler 1986, pp. 21–2). We can identify five of these:

1. The sale of publicly owned assets to buyers in the private sector. An asset may be wholly or partly sold to entrepreneurs or to workers, either privately or in association with a public share issue.
2. Allowing the private sector to compete against a government enterprise where this was not previously permitted.
3. Contracting out for services previously undertaken by government departments, e.g. garbage collection.
4. Government provision of vouchers to consumers for specific services, such as education, on the assumption that voucher holders will 'shop around' for the best value.
5. 'Transfer without sale, e.g. converting Medibank Private into a contributor-owned co-operative' (Albon 1986, p. 9).

Make a list of some areas of government involvement in economic activity that might appropriately be privatised. (Consider government at any level.)

While business interests are often strong advocates of deregulation it would be wrong to imply that business people want to be free of *all* regulation. For example:

- mining companies want to retain depreciation concessions on capital equipment;
- the Australian textile industry does not want protective tariffs to be removed;
- taxi owners want to retain licensing; and
- traditional medicine does not want competition from alternative medicine.

The market discipline of competition can have harsh consequences. A business person's attitude to competition may be, 'It's fine, so long as it doesn't happen to me!'. (Recall Revlon's comment on competition.) Regulation, whether it is public or private, can dampen economically undesirable effects of competition or encourage economically desirable ones. An economist would argue that we should move in the direction of:

- *removing* regulation that impedes market discipline and leads to reductions in economic performance;
- *retaining* (even strengthening) regulation that reinforces market discipline and leads to increased economic performance.

☐ *Read Sections 19-3 and 19-4 in Begg et al. (2000), pp. 318–22, on the UK experience with privatisation, and Reading 11.4 by Fraser (1996) on the relevance of this experience to Australian policy.*

- *What complications have arisen with the privatisation of public utilities in the UK?*
- *Are we seeing these problems in Australia or are we likely to?*
- *How does Fraser suggest we respond to these problems?*

The attractions of privatisation

As we have seen, one reason for the trend to privatisation could be to curb the abuse of public monopoly power. Other reasons for the trend may be:

- dissatisfaction with the economic outcomes of nationalisation; and,
- renewed faith in the market system.

The attractions of privatisation may be different for economies with different cultural backgrounds. For example, the United Kingdom nationalised a number of industries after World War II (so privatisation there may be seen as a reversal of nationalisation), whereas the United States has consistently placed great reliance on market forces. The attractions of privatisation are not limited to industrially developed economies. For example, when Bangladesh gained independent status as a nation in 1971, the government embarked upon a nationalisation program. Since about 1977 there has been increasing privatisation in that country in a bid to reduce 'featherbedding' and to increase productivity and economic efficiency in general, and because of a shift to the right in its new governments.

Some basic economic attractions of privatisation for governments are thus as follows.

- The possibility of reducing inefficiencies in some public enterprises and increasing efficiency. Numerous comparative studies of privatisation overseas indicate that increased efficiency was obtained.
- The freeing up of public funds for other uses.
- The possibility of curbing trade union power. Public enterprises may be ' ... perceived as repositories of excessive trade union power, which leads to irresponsible behaviour and excessive wage settlements ...' (Curwen 1986, p. 164).
- The possibility of raising the level of consumer sovereignty. To do so increases economic freedom and can stimulate increased economic efficiency.

Most of these factors come down to improvements in efficiency. The Australian Economic Planning Advisory Council has stated that transferring the ownership of public enterprises to the private sector could lead to improvements in efficiency because of:

- the removal of the constraints which are often associated with the public ownership (particularly those which inhibit financial independence);
- the discipline imposed by competition for funds in financial markets, which would require investments to yield commercial rates of return;
- the development of a more entrepreneurial and flexible approach to resource management and product innovation. (Economic Planning Advisory Council 1987, p. 42)

☐ *Consider Reading 11.5 covering evidence on the cost impact of privatising prisons. When reading this piece, consider the difficulties in identifying what cost differences can be attributed to privatisation and the relevance of this evidence to the Australian situation.*

NSW and Victoria have recently introduced privately run prisons. Are we likely to see more established in Australia? What factors apart from cost reductions are likely to determine this trend?

The continuing debate

It should be noted that privatisation is still a highly controversial policy and there are real debates within the economics profession on just how far privatisation should go.

Hugh Stretton has argued that:

- 'Some activities … have generally gone best in private ownership.
- Some activities … have generally gone best in public or non-profit ownership.
- [Some] go well in either ownership' (NCAAC 1988, p. 8, para. 18).

He concluded that 'in the light of abundant evidence, it is not intellectually respectable to go on saying that either kind of ownership is superior' (NCAAC 1988, p. 8, para. 19).

An area of particular concern in policy circles relates to the privatisation of natural monopolies. (Recall that a natural monopoly has a *LRAC* curve that is downward sloping over the full range of demand.) In the natural monopoly case, privatisation is likely to involve replacing a public monopoly with a regulated private monopoly. It is not obvious which form of organisation would be superior from a societal perspective. Clearly this policy problem needs to evaluated on a case by case basis.

The framework we developed in Topic 10 for evaluating intervention to achieve increases in efficiency is relevant here. From an economic perspective we are concerned with evaluating if government ownership is the most appropriate policy instrument to correct the market failure that may exist in an industry. If we form the judgement that it is not, privatisation would appear to be part of an appropriate policy response.

One of the most common criticisms levelled at privatisation initiatives is that they amount to 'selling off the family jewels'. It is often suggested that profitable public enterprises should not be sold. Economists would argue that in a market system the profitability of the enterprise is relevant in determining the price that an enterprise should be sold for, but it is not relevant in assessing whether an enterprise should be considered for privatisation.

Summary

In this topic, we have sought to provide you with a broad overview of what constitutes competition in theory, and to indicate the rationale for antitrust intervention in markets. The competitive process has the potential to impose considerable discipline upon firms. However, the presence of market failure means that this discipline need not be translated into gains in community welfare. While free market forces cannot consistently be relied upon satisfactorily to remedy the causes and effects of anti-competitive behaviour, it is also clear that government intervention in general, and anti-trust action in particular, may impose substantial costs on the business community. Therefore, deregulation in general, and privatisation in particular, may be appropriate policies to encourage competition in some industries.

Review questions

Review question 11.1

The newspaper extract reproduced below from the Australian Financial Review, 9 September 1991, relates to the sale of duty free goods. Read it and think about the issues raised by the report, and then decide:

(a) What are the product boundaries of the relevant market?

(b) How you would identify the sellers in this market?

(c) What are the geographic boundaries of the market?

(d) What are the entry barriers for new firms contemplating coming into this market?

(e) How you would identify potential entrants into the market?

(f) How the sellers of duty free goods might compete with each other?

Downtown bids for top airport duty-free

By P.D. Jack

The British-owned retail giant Allders Pty Ltd is being challenged for its near-monopoly of Australia's airport duty-free stores.

With about 90 per cent of the Australian airport market tied up through exclusive dealing contracts with the Federal Airports Corporation, tenders for the crown jewel of the Australian duty-free business, Sydney's Kingsford Smith Airport, closed last Thursday.

Adelaide's mini-conglomerate M.S. McLeod Holdings Ltd, through its wholly owned subsidiary, Downtown Duty Fee, is making a determined bid for the rights to operate out of Sydney and Perth. Tenders for Perth closed last month.

The Australian airport duty-free business was worth $107 million in the year to March 31, 1991, of which Sydney airport business accounted for $64 million while Perth took $16.2 million.

The total duty-free market in Australia, including the off-airport shops, was worth $500 million last year.

The airport concessions are a big money spinner for the FAC. Of its $102 million earned in the year to March 31 from commercial activities (car parking, meals, snacks, bars, etc), $34 million came from fees paid by concessionaires at FAC's five main aerodromes: Sydney, Melbourne, Adelaide, Brisbane and Perth.

The FAC hopes to raise this take by writing new terms of contract, linking its fee with possible business rather than charging a set fee.

Its manager, commercial policy, Mr Brian Maxwell, said the tenderers had quoted on a per-passenger basis.

If more passengers come through the airport, the concessionaire can expect to make more money and will thus pay the FAC more. Conversely, if fewer come through, the concessionaire is not forced to squeeze them for more in order to meet fixed rental commitments.

There were 4.4 million international passengers through Sydney last year, a considerable decrease on previous years.

Mr Maxwell says the new fee system should make the shops 'much more competitive', a tacit admission that prices, at Sydney at least, have not been cheap over the past few years.

Allders, the present concessionaire of all five main international airports, is a British retailer which was bought out by management from the Hanson Trust in 1989.

Mr Maxwell said the FAC did not have an active policy to avoid monopoly and said the tenders would be awarded on commercial merit.

Nor did Mr Maxwell agree that having only one duty-free outlet per airport was a monopoly, although he did grant that it was one 'in spatial terms'.

He said the Sydney and Perth tenders had attracted significant international interest.

The FAC did not have a 'Buy Australian' policy as regards the duty-free concessionaire. 'It's an international business,' he said.

Source: Australian Financial Review, 9 September 1991.

Review question 11.2

Outline the economic efficiency case for government regulation of firm level competitive practices.

Review question 11.3

(a) Why are governments around the world rushing to sell off 'profitable' government businesses ?

(b) What risks are attached to this policy?

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Suggested answers

Topic 11

In-text questions

Question 11.1

(a) It is never easy to identify with any precision those firms which may be contemplating entry into a market, let alone those which may successfully enter the market and constrain the incumbent firms. Presumably it is easier for an incumbent than for an outsider to identify likely newcomers, as existing firms will need to keep a strategic eye on both actual as well as potential rivals, if they are not going to be supplanted in the market.

Among the characteristics which may help to identify a potential entrant are:

- if a licence is needed to operate in the industry for any reason, then a check on the activities of previous or current applicants may reveal an intention to enter;
- firms operating in the same product market in other geographical areas interstate or overseas may be well placed to enter the relevant market;
- firms with access to the same raw materials, or which use similar production processes, or which have similar distribution networks, may be able to enter the market quickly;
- less vertically integrated rivals may be tempted to integrate into the relevant market in order to stand on an equal footing with the incumbents;
- firms whose main markets are in decline, and which need to diversify in order to remain viable;
- firms which have sunk the costs necessary to start in the market, that is, firms which have made a commitment to being in the market.

Remember that economists value potential competition for the threat it poses to the incumbents, and so it could be expected that if the incumbents see any firm as a potential threat, board minutes, sales meeting agendas etc will note the strategic moves being considered to counter this impending threat.

You should note that as one of the main effects of potential entry is to create uncertainty in the market, some economists believe that the larger the list of potential entrants, the lower is the likelihood of actual entry, because each potential entrant cannot be sure how much entry will occur, and therefore will be uncertain as to the amount by which competitive conditions in the market will have changed post-entry compared with pre-entry.

(b) (i) The main source of potential competition would be from large overseas whitegoods manufacturers which do not currently produce in Australia, or which have not previously exported to Australia. The sunk costs involved in whitegoods manufacturing, together with the need to overcome the pioneering brand advantages of incumbent firms and create a believable image of quality for the new firm, mean that new entry by a firm not currently producing whitegoods is unlikely, unless it proceeds via what is called 'toe-hold' entry, with, say, a producer of small electrical appliances beginning to make some simple whitegoods like, for example, clothes dryers.

(ii) After the recent merger between the BTR-Nylex subsidiary ACI and the glass-making operations of the Smorgon group, there is effectively a monopoly producer of glass bottles in Australia. However, some specialty bottles are imported from plants in south-east Asian countries where there is considerable excess capacity. Depending on the price, quality and regularity of delivery, such imports could become a regular feature of the Australian market and constrain the domestic monopolist, although whether they could provide the volume needed for beer production in particular is unlikely.

The technology exists overseas, however, for the construction and operation of glass plants to be used in-house by firms with a large requirement for bottles which do not need highly sophisticated technology in their manufacture. A large user like a brewer, or perhaps one of Australia's largest wine producing firms like S.A. Brewing, or a small consortium of wine producers, could perhaps justify the capital expenditure needed to set up such a plant, and could use this threat of entry to exercise a little countervailing power against the incumbent monopolist.

(iii) One is tempted to say none exist, as there is—or rather was—only one Elvis. But pirate copies do exist; and there may be other singers, past, present or yet to be discovered, whose records could constitute a close substitute for Elvis records, at least for many potential purchasers.

(iv) The sky could be the limit here, in theory anyhow. While there is a lot of proprietary software, there is also a lot of pirating, copying, and 'inventing around' (in some cases, with not too much new work being done, leading to expensive lawsuits), together with the hundreds, if not thousands, of ever-hopeful large and small computer 'corporations' and individuals who hope to write the all-time big-selling business or pleasure software.

(v) As for whitegoods, a main source of potential competitors would be overseas firms producing parts and accessories. The need to secure high volume contracts with car manufacturers would probably make entry very difficult for any new firm without considerable experience in supplying to this industry.

Probably the biggest threat, apart from imports, for the incumbent firms would be the ability, if they so chose (this is now happening in some parts of the world), of the car manufacturers themselves to integrate backwards into the production of parts and accessories. For this to happen, the advantages of in-house production with scheduling economies, parts standardisation around the world and so on, would have to be compared with the sunk costs of setting up the new area of operation and the associated learning problems.

(c) There are many economic outcomes which can have multiple causes, in both macroeconomics as well as microeconomics. It is not advisable, having observed a particular outcome, to then simply conclude that it occurred because of your favourite pet theory. Careful empirical investigation is needed to consider all the possible explanations, and to eliminate those which were not at work.

Prices could increase simultaneously for several reasons. Among the 'innocent' reasons are:

- an increase in the price of a common input which accounts for a high percentage of the total cost of inputs;
- adoption of new technology or installation of new equipment by all of the firms in the market;
- common reaction to changed market conditions;
- common market practice to change prices at around the same time each year;
- following quickly, but independently (i.e. no collusion or coercion) a price increase by a rival—the so-called 'news travels fast' phenomenon, because of an independently held, but nevertheless shared by all firms in the industry, belief that prices need to increase in order to maintain profitability (this phenomenon is called 'conscious parallelism of behaviour' by economists).

The last point would be regarded by some economists as borderline behaviour, with respect to competition. All firms in a market might simply elect to follow the price increase of an acknowledged price leader, or they could have been around for so long that a form of tacit collusion has emerged, whereby they all implicitly agree to follow a leader or where a strong price signal is given by one firm that it is time for prices to rise. The other alternative, of course, is that a formal agreement has been reached to fix prices.

Contemporaneous price adjustments are difficult to deal with from a regulatory point of view, as they can be consistent with either collusive behaviour or competitive market responses. In the absence of direct evidence that a breach of the law has occurred, the regulatory authority has to try and discount the likelihood of all of the innocent explanations of the parallel behaviour, such that the only valid inference which can be drawn from the evidence is one of collusion. The rebuttal of all of the other possible explanations needs to be strong in order to convince a court that the evidence implies collusion.

Question 11.2

Fisher argues that monopoly power only exists if firms can earn greater than normal profit levels. Large market share is not a reliable guide to monopoly power.

Question 11.3

It does make sense to talk about an Australian market for goods and services like the ones listed, so long as in the drawing up of the boundaries of the markets, actual as well as potential competition from overseas suppliers has been taken into account. In other words, for each of these five goods or services, the market is likely to include buyers and/or sellers from overseas, whose operations will act to constrain the sellers in the domestic market. Effectively, you could say that there is an international market for each of the products or services specified, with there perhaps being an Australian sub-market.

This is certainly the case for gold and academics, where buyers and sellers trade all over the world, and this is also true for many kinds of insurance like marine insurance and the general re-insurance of risks. For high value products like computers and cars, freight costs are small in relation to the value of the product and there may be significant scale and scope economies to be gained by concentrating production in only a small number of international locations and exporting to other countries, unless entry to domestic markets is hindered by tariff and non-tariff barriers to trade. Thus, overseas sellers could be seen as potentially, even if not actually, operating in the Australian market.

Where such international trade can take place unhindered by artificial or real barriers (like transport costs, tastes and the like), then mergers between domestic firms might not be a problem, as real constraints will be provided for the domestic firm(s) from overseas. But there are two qualifications which need to be added to this statement:

- for non-traded goods and services (of which there are many) there can be no relaxation on the vigilance with which merger proposals must be assessed, as foreign competition cannot be relied on to keep the more concentrated (after the merger) domestic market working in a competitive manner

- while economists cannot be expected to have a crystal ball which sees accurately into the far-distant future, the presence of foreign competition now, either actual or potential, may not be present in the future due to changes in government policy, changes in foreign firms' priorities and interests and so on, and so any approval of a domestic merger based on current levels of foreign competition must keep this possibility in mind.

Question 11.4

In many cases, for example, cars and computers, a second-hand product could be seen as a good substitute by many buyers for a new model of the same product, depending on the relative prices. Thus producers and retail sellers of the new product will have to take into account what is happening in second-hand markets.

This is perhaps best illustrated by considering how a monopoly producer of a metal like aluminium might consider recycling activities when setting its output rate and the price which it should charge. If recycled aluminium is a close substitute for primary aluminium for those who use the metal, then the activities of both the primary producer and the recyclers should be included in the one market, as firms conducting the one activity will be closely competitive with firms operating in the other area. However, you should note that the primary producer can anticipate the recycling rate and can adjust its output accordingly, and this means that this firm does not lose any market power over the primary product as a result of the recycling, even though it has lost market share in the broad market of new plus recycled product.

You need only to consider how new car prices and second-hand car prices are very closely correlated to appreciate that there are close connections between new and second-hand products. Not only are prices highly correlated, but second-hand prices provide a limit to the extent to which new car prices can be raised without seriously affecting sales, and conversely, new car prices provide an upper limit to the price of corresponding models in the used car market.

Question 11.5

Synthetic gasoline is both an input into the production of leaded petrol, as well as being a final product itself. If you accept the line of reasoning in the Koppers case, then the product dimension of the market will be quite broad, including all types of finished gasoline, as well as crude oils, semi-refined products known as feedstocks, like naphtha, and other blendstocks from which finished gasoline can be made. The reason for this is that with the appropriate refining technology, all of these inputs can be used to produce finished gasoline, the choice of raw materials often being determined by the availability of refining capacity, and a comparison of the relative costs of using different raw materials. There is no unique combination of raw materials which yields any particular technical specification for finished gasoline. Given a sufficient price incentive, a refining company with an adaptable plant could easily switch from one input combination to another in order to minimise its costs of production and maximise its profits. The various inputs are certainly not close substitutes for each other in their inherent physical form, but on a price-adjusted basis, allowing for transport and refining costs, they each end up after processing as virtually identical substitutes for each other in the production of finished gasoline (and other commercially usable fuels).

From the geographic perspective, there clearly exists an international market for crude oils, feedstocks, blendstocks and finished gasoline. Tankers move all these products around constantly; cargoes are bought and sold while vessels are in transit; prices posted for the various products in the major world oil trading cities closely track each other.

Arbitrage between markets and speculation bring prices of the different products closely into line with each other.

Refiners with modern refineries can handle any kind of input, and hence will source cargoes from anywhere in the world where the price is right.

Similarly, buyers of finished gasoline will look to the international market for supplies if the price on domestic markets exceeds the world price plus freight, and there is no shortage of tankers available for chartering at a minute's notice.

Thus, the market could be described as the international market for the supply and wholesale distribution of gasoline, gasoline-yielding feedstocks and blendstocks, including syngas.

Review questions

Review question 11.1

(a) It is tempting to say that duty free goods are duty free goods and leave it at that. After all, it is not any inherent, intrinsic physical characteristic of the 'product' which makes it distinct from other goods, but rather the absence of the government-imposed duties and taxes which are to be found on identical products sold to domestic buyers not fortunate enough to be heading off for an overseas holiday.

Therefore, duty free goods could be defined as those products usually sold to overseas travellers free of normal duties and sales taxes. Within this product category, of course, there is a large number of quite distinct products ranging from alcohol and perfumes to cameras and watches, none of which is readily substitutable for the others in any functional sense (perhaps other than as gifts). It is a significant price differential, and the conditions under which they can be bought, which makes this group of goods different from the same goods sold under normal retail conditions.

(b) It might be tempting to say that the sellers are those entities licensed by the government to sell goods at duty-free prices, and identified as duty-free stores. But there are two complications here. A market should include all those sellers in close competition with each other for a common group of buyers. The small number of duty-free operators in each Australian 'gateway' city have to contend with at least four other sources of competition:

- from normal retailers who are prepared to do all the necessary paperwork and sell at duty-free prices to people who can prove that they are going overseas;
- from retailers whose discount prices can in some cases bring the product price down close to duty-free prices, at least for some goods;
- from sellers in overseas countries which do not impose duties on goods; and
- from duty-free stores in overseas countries (and also from cabin crew on planes!) likely to be visited by the departing traveller.

(c) From the previous answer, you should now be able to understand that the market for duty-free goods is a geographically diverse one, with boundaries stretching, for the individual traveller, as far as the number of destinations on the trip. Overseas duty-free shops do advertise in domestic publications aimed at tourists and tourism. All manner of sources of travel advice tell the future overseas traveller to compare prices at home with those overseas. A person leaving, say, Adelaide, with a domestic connecting flight to an overseas flight out of Melbourne, can choose between city and airport duty free shops in both cities, as well as those awaiting him or her overseas.

However, for last minute purchases, the on-airport store has a monopoly (as does the incoming duty-free store for things like alcohol). You may have noticed that these shops are usually rather more expensive than other duty-free outlets.

It is not possible to say whether this is because of the high rents which they must pay for these desirable sites, or whether it is due to their taking advantage of their (temporary) monopoly position, by charging a premium for offering the traveller the convenience of being able to shop at the last minute.

Therefore, within a very wide geographic market, assuming that most travellers are well-informed (do you think that the position might be different for first-time overseas travellers?), there may well be identified a series of potentially quite narrow geographic sub-markets, within which substitution possibilities are very strong, but between which there are the sort of breaks in the chain of substitution referred to by the Trade Practices Tribunal in the Tooth/Toohey case.

(d) Looking at this only from the Australian side of the market, the main entry barriers are likely to be:

- the need to secure any necessary licences to operate;
- the availability of suitable prime space at airports;
- scale and scope advantages accruing to established multi-shop and multi-location duty-free operators;
- the need to raise large amounts of capital in order to be able to enter the market and compete on an equal footing with established firms in terms of infrastructure, product range, etc;
- sunk costs of advertising, developing a market image and lobbying to secure an operating licence.

(e) This is not easy. The three main areas from which entry is likely to come are:

- international duty-free operators with stores in other countries who 'know the ropes' and who may want to expand their networks for the convenience of their customers, as well as to secure operating and advertising economies;
- duty-free operators operating in other Australian locations;
- stores currently selling goods at duty-included prices which decide to expand into the duty-free area. For these stores, of course, much more paperwork, as well as bond storage, would be necessary in order to sell a wide range of duty-free goods.

(f) The five main intrinsic competitive weapons are likely to be price, product range, the provision of reliable advice on items like video cameras and electronic equipment, location of the store and convenience of shopping, together of course with reputation. Links with travel agents and airlines, to give away discount vouchers or similar 'come-ons' when tickets are purchased, may also be a competitive strategy which can be used, and selected advertising in publications read by travellers may also be used to good effect.

Review question 11.2

Market failure may exist (e.g. lack of information or exploitation of market power) which results in the free market producing a suboptimal outcome. These market failures represent a necessary but not sufficient condition to justify market regulation. Governments must also be able to identify a policy (or set of policies) that improve the situation.

Review question 11.3

(a) This could be explained in terms of private interest (appeasing interest groups) or public interest. In the case of the public interest model one could argue that government ownership is no longer seen as the most appropriate policy to deal with the market imperfections that exist in a modern economy.

(b) This policy is difficult to implement for a number of reasons.

- It adversely affects significant interest groups in the policy community.
- It involves economic issues that are difficult to explain to an electorate.
- It often involves moving from public monopolies to markets that exhibit artificial competition and high degrees of public regulation over private operators. Governments had little experience in running these regulatory bodies and can be expected to make mistakes.

Re Queensland Co-operative Milling Association Ltd, Defiance Holdings Ltd (Proposed Mergers with Barnes Milling Ltd) (1976)

Reading 11.1

Australian Trade Practices Reports

Since we give such importance to the relevance of competitive consideration in proceedings for authorization, we add a few comments on how the Tribunal views competition. However, 'competition' is such a very rich concept (containing within it numbers of ideas) that we should not wish to attempt any final definition which might, in some market settings, prove misleading or which might, in respect of some future application, be unduly restrictive. Instead we explore some of the connotations of the term.

Competition may be valued for many reasons as serving economic, social and political goals. But in identifying the existence of competition in particular industries or markets, we must focus upon its economic role as a device for controlling the disposition of society's resources. Thus we think of competition as a mechanism for discovery of market information and for enforcement of business decisions in the light of this information. It is a mechanism, first, for firms discovering the kinds of goods and services the community wants and the manner in which these may be supplied in the cheapest possible way. Prices and profits are the signals which register the play of these forces of demand and supply. At the same time, competition is a mechanism of enforcement: firms disregard these signals at their peril, being fully aware that there are other firms, either currently in existence or as yet unborn, which would be only too willing to encroach upon their market share and ultimately supplant them.

This does not mean that we view competition as a series of passive, mechanical responses to 'impersonal market forces'. There is of course a creative role for firms in devising the new product, the new technology, the more effective service or improved cost efficiency. And there are opportunities and rewards as well as punishments. Competition is a dynamic process' but that process is generated by market pressure from alternative sources of supply and the desire to keep ahead.

As was said by the U.S. Attorney-Generals National Committee to Study the Antitrust Laws in its Report of 195S (at p. 320):

> 'The basic characteristic of effective competition in the economic sense is that no one seller, and no group of sellers acting in concert, has the power to choose its level of profits by giving less and charging more. Where there is workable competition, rival sellers, whether existing competitors or new potential entrants into the field, would keep this power in check by offering or threatening to offer effective inducements…'.

Or again, as is often said in U.S. antitrust cases, the antithesis of competition is undue market power, in the sense of the power to raise price and exclude entry. That power may or may not be exercised. Rather, where there is significant market power the firm (or group of firms acting in concert) is sufficiently free from market pressures to 'administer' its own production and selling policies at its discretion. Firms may be public spirited in their motivation; but if their business conduct is not subject to severe market constraints this is not competition. In such a case there is substituted the vales, incentives and penalties of management for the values, incentives and penalties of the market place.

Competition expresses itself as rivalrous market behaviour… In the course of these proceedings, two rather different emphases were placed upon the most useful form such rivalry can take. On the one hand it was put to us that price competition is the most valuable and desirable form of competition. On the other hand it was said that if there is rivalry in other dimensions of business conduct—in service, in technology, in quality and consistency of product—an absence of price competition need not be of great concern.

In our view effective competition requires both that prices should be flexible, reflecting the forces of demand and supply, and that there should be independent rivalry in all dimensions of the price-product-service packages offered to consumers and customers.

Competition is a process rather than a situation. Nevertheless, whether firms compete is very much a matter of the structure of the markets in which they operate. The elements of market structure which we would stress as needing to be scanned in any case are these:

(1) the number and size distribution of independent sellers, especially the degree of market concentration;

(2) the height of barriers to entry, that is the ease with which new firms may enter and secure a viable market;

(3) the extent to which the products of the industry are characterized by extreme product differentiation and sales promotion;

(4) the character of 'vertical relationships' with customers and with suppliers and the extent of vertical integration; and

(5) the nature of any formal, stable and fundamental arrangements between firms which restrict their ability to function as independent entities.

Of all these elements of market structure, no doubt the most important is (2), the condition of entry. For its is the ease with which firms may enter which establishes the possibilities of market concentration over time; and it is the threat of the entry of a new firm or a new plant into a market which operates as the ultimate regulator of competitive conduct.

How decisive is it, then, that the acquisition of Barnes by either Defiance or QCMA would raise market concentration ratios in some markets in some degree? Evidently, provided markets have been defined appropriately, it is relevant but not decisive. While the equation of anti-competitive effect with enhanced concentration is tempting in its mechanical simplicity, there is much more to the idea of competition than this. No doubt, other things being equal, significantly lower market concentration is preferable to a high level. But other things are rarely likely to be equal, as we discover below. Moreover, the very significance of the change in the concentration ratio will depend upon other competitive characteristics of the industry.

Source: *Australian Trade Practices Reports,* vol. 1, para. 40-012, pp. 17, 245–6, 1976, CCH, North Ryde, NSW.

Arnotts Limited and Ors v. Trade Practices Commission (1990)

Reading 11.2

Australian Trade Practices Reports

Dominance

The next question is whether Arnotts is in a position to dominate the market defined by the trial Judge, within the meaning of sec. (50(1)(b) of the Act.

As we have already indicated, Beaumont J. found that it was. Towards the end of his judgment his Honour expressly referred to some matters which, he though, indicated dominance (1990) ATPR at p. 51,080;93 A.L.R. at pp. 707–708:

> 'Arnotts has had, for many years, a very large market share. True, Arnotts has some competition in the supply of biscuits, but not much. The evidence shows that he members of the biscuit industry and the members of the grocery trade, being the 'players' in the market, act upon the belief that Arnotts is in a position to exercise, and does exercise, from time to time, commanding influence in the market. The evidence establishes that the size and strength of Arnotts is such that, in practice, other entities are unable or unwilling to offer any significant competition to Arnotts in the biscuit market in the medium or long term. Even in the short term, there is an obvious reluctance to meet Arnotts 'head-on' or directly. Instead, other suppliers of biscuits seek to find 'gaps' or 'niches' in the market. All of this conduct is an indication that Arnotts holds a commanding influence in the market.'

The appellants challenge these findings, contending that the evidence showed fierce competition within the biscuit industry. Counsel submit that the existence of competition is incompatible with dominance, the essence of which is the unwillingness of other market participants actively to compete with the market leader. They also submit that there are no significant barriers preventing new suppliers of biscuit products commencing business within Australia, that new viable suppliers have in fact recently entered the field and that the major supermarket chains—notably Coles Myer, Woolworths and Franklins—exercise such power as purchasers of biscuits that they prevent the possession or acquisition of any dominant market power by any supplier, including Arnotts.

The decided cases have stated criteria to which regard may be had in determining whether a participant enjoys a dominant position in a market. But those criteria vary according to the facts and circumstances of each case. No inflexible rule can be laid down, except perhaps in the case of barriers to entry.

Some of the European cases provide assistance in the resolution of questions of market power and dominance. Although they arise out of a different statute they apply similar economic concepts.

In *Europemballage Corporation and Continental Can Company Inc. v. European Communities Commission (1973)* C.M.L.R. *199 ('Continental Can')* the European Court appears to have taken into account, on the question of dominant position: market share for the products in question; the size of the new unit created by the merger in relation to the size of competitors in the market; the economic strength of customers in relation to the new unit and potential competition either from manufacturers of the same products situated in other geographical markets or from manufacturers of other products situated in the common market.

United Brands, a case of high barriers to entry, adopted what was said in *Continental Can.* There the Commission had based its view of dominance on a series of factors which, when taken together, were said to give United Brands an unchallengeable ascendancy over its competitors: its market share; the diversity of its sources of supply; the homogeneous nature of its product; its distribution system; its marketing system and publicity campaigns; the diversified nature of its operation and its vertical integration. The Court said that 'dominant position' relates to a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by giving it the power to behave to an appreciable extent independently of its competitors, customers and, ultimately, its consumers. The European Court pointed out that, speaking generally, a dominant position derives from a combination of factors: the company's structure; the situation on the market so far as competition is concerned; whether a trader has succeeded in winning a large market share (a trader does not have to eliminate all opportunity for competition to be in a dominant position); and barriers to entry, which may include any exceptionally large capital investment required for the creation and running of a competitive business enterprise. The decision stressed that it is the cumulative effect of these matters which determines whether an enterprise has a dominant position in the relevant market.

Hoffmann-La Roche was also a barrier to entry case. The European Court acknowledged that the importance of market share might vary from one market to another; but it said that the view might legitimately be taken that very large market shares are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position. The Court went on at p. *275:*

> 'An undertaking which has a very large market share and holds it for some time, by, means of the volume of production and the scale of the supply which it stands for—without those having much smaller market shares being able to meet rapidly the demand from those who would like to break awa from the undertaking which has the largest market share—is by virtue of that share in a position of strength which makes it an unavoidable trading partner and which already because of this secures for it, at the very least during relatively long

> periods that freedom of action which is the special feature of a dominant position.'

In *Hoffmann-La Roche* the Court rejected reliance on mere market share, saying that, on the facts of that case, this might just as well result from effective competitive behaviour as from a position which ensures that the company can behave independently of competitors. But the Court thought it always to be relevant to consider the relationship between the market share of the undertaking concerned and that of its competitors, especially those of the next largest, the technological lead of an undertaking over its competitors, the existence of a highly developed sales network and the absence of potential competition; the first because it enables the competitive strength of the undertaking in question to be assessed, the second and third because they represent in themselves technical and commercial advantages and the fourth because it is the consequence of the existence of obstacles preventing new competitors from having access to the market.

A little more should be said about the concept of barriers to entry.

Barriers to entry are barriers which confront the entry of a new firm into the market or barriers that confront an existing firm seeking to increase its market share.

Barriers to entry may arise from a variety of courses, including the following:

(a) Blocked access: control of the supply of essential raw materials by established firms, distribution channels or other elements in the market, making new entry either impossible or too costly.

(b) Capital requirements for a new market entrant. It is necessary to remember, however, that there is a distinction between costs of entry and barriers to entry. Not all costs of entry represent a barrier. Critical factors are the extent of the predicted costs and the likely return.

(c) Economies of scale: the scale of activities of existing market participants may be such as to lower their unit costs to a point where a newcomer could not compete, except at a loss.

(d) Product differentiation: a long established firm may have the benefit of accumulated goodwill which a new entrant can only counteract by bearing higher promotional costs or suffering lower selling prices than the existing firms. See Areeda, *Antitrust Analysis—Problems, Text, Cases* 3rd ed. at para. 117, 604.

(e) Legal restrictions: such restrictions may take the form of a statutory monopoly on the activity itself—for example, a broadcasting licence—or restrictions on access to commercially advantageous material—for example, by legislation dealing with patents, trade marks, copyright, etc.

Some of the theoretical barriers to entry do not apply to the present case. As we see the evidence, it indicates five potential barriers to entry: the difficulties facing a competitor by reason of Arnotts' position as market (65% share) and price leader; the capital cost which would be incurred by another organisation which sought to compete with Arnotts across a broad product range; the strength of brand loyalty enjoyed by Arnotts; the competitive advantage ensuing from Arnotts' economies of scale and range; and the difficulty which a competitor would face in obtaining sufficient supermarket shelf space to support an 'across-the-range' operation. The five matters are, of course, entwined.

In the United States the possession by one participant of a large market share has been regarded as raising a presumption as to an inherent lessening of competition: see *United States v. Philadelphia National Bank* 371 U.S. 321 at p. 363 (1963) and *United States v. General Dynamics Corporation 415 U.S.* 486 at pp. 496–498 (1974). We were not asked to consider whether Australian courts should go so far. Arnotts' market leadership may be considered in conjunction with its price leadership and the other matters we have listed. Price leadership may itself be an indicator of market power. One of the indications of market power is the capacity of a participant to raise its prices without competitors taking away customers. In the present case, without going to the detail of the instances revealed in the evidence, it is clear that, generally speaking, Arnotts has been able to fix its prices without reference to those of its competitors; whereas the competitors have been severely inhibited in their price-fixing by a desire not to exceed Arnotts' price for the particular product. These points were made in one of Arnotts' own documents, the 1987/1988 marketing plan. That document concludes a discussion of the company's pricing policy with the following words:

> 'The size and historical position of the company in the industry puts us in the position of 'price leaders', a situation in which competitors generally follow any deviation in price, especially upward.
>
> Our ability to maintain a 'price leader' policy will continue to be reinforced by our strong consumer franchise, consistent advertising, volume production and technological leadership.'

Surprisingly, in a case beset with such a surfeit of evidence, there is a paucity of detail about the next three matters. But there is enough to show that these barriers do exist. As to capital cost, it is highly significant that neither Weston nor Nabisco, both members of large multinational conglomerates, has been willing to 'take on' Arnotts across its full range of products. It is particularly noteworthy that Weston has never manufactured a dry biscuit, despite the fact that dry biscuits constitute some 23% of all biscuits sold in Australia and that this proportion is growing. A clue to the reason emerges from the Weston 1989 biscuit marketing plan, which is in evidence. That plan discussed the possibility of manufacturing wafers, a product not currently offered by the company. But the comment was made that 'to produce the products necessary to compete against Arnotts, it would require an investment of $1,250,000 for plant and equipment' and would result in a gross factory margin of only V4% after applying nominal overheads. When one considers the enormous infrastructure enjoyed by Arnotts, it is obvious that cost is a major barrier to effective competition with Arnotts. We accept that economists do not regard mere cost as a barrier to entry unless there is some asymmetry between the amount that the incumbent had to spend in order to acquire the assets that it has acquired and the amount that the newcomer has to spend. But when one is comparing the cost which would have been incurred by Arnotts over 140 years with the outlay required to duplicate those resources at present day prices there is an obvious, substantial asymmetry.

The problem of cost is compounded by brand loyalty. Any substantial competitor would be faced with the task of challenging a highly efficient, well regarded company manufacturing biscuits known, by their present names, to generations of Australians. The extent and depth of Arnotts' brand loyalty is indicated by the fact that, despite the best endeavours of other suppliers, Arnotts manages, year after year, to market two out of every three biscuits solid in Australia; and this despite the fact that most of its lines sell for prices at, or near, the top of the price range of comparable products. To the brand loyalty attaching to the name 'Arnotts' must be added the effect of Arnotts' use of the 'Sunshine' brand. Arnotts already achieves the greatest width of range, through the full spectrum of biscuit products. By the use of 'Sunshine' brand, Arnotts adds depth to width; by marketing two versions of some types of biscuits, one at the top of the range under the 'Arnotts' label, and a 'Sunshine' version which is price-competitive with cheaper brands and generics.

Arnotts' economies of scale flow, of course, from its market share. Once again, more detail would have been helpful. But it is clear that Arnotts does enjoy substantial economies of scale. Its volume provides flexibility in the use of factory ovens and warehouses and unit economies in advertising, with emphasis upon the name and tradition of Arnotts. Its great product range minimises seasonal sales fluctuations, with resulting benefits to cash flow, the efficient use of manufacturing and distribution resources and retention of supermarket shelf space allocations.

Similarly, there are economies of scale in distribution costs. A company which accounts for 65% of all biscuit sales must have a marked advantage, in terms of unit distribution costs, over companies which have only 13% or 8% of the market. All three companies distribute directly to the retail stores but the Arnotts' truck must be off-loading many more biscuits at each stop. Again, there must be an advantage to Arnotts in spreading the cost of a sales representative's visit to a store amongst 65 units, as against Weston's 13 units or Nabisco's 8.

The final matter which we have mentioned, supermarket shelf space, loomed large in the trial Judge's reasons. We have already quoted his findings that Arnotts' biscuits are usually placed first in the supermarket traffic flow and occupy about 50% of the total biscuit bar. As his Honour said, '(t)his confers a considerable marketing advantage upon Arnotts'. The appellants do not challenge the accuracy of these findings, although counsel pointed out that the evidence did indicate some exceptions. But they say that a figure of only 50%—less than Arnotts' market share—is a counter indication of dominance because it shows that Arnotts is not able to exact its 'fair share' of shelf space.

It seems to us that counsel's argument misses the point made by the trial Judge. The amount of shelf space allocated to Arnotts results in a situation in which the shelf space available to other biscuit suppliers is extremely limited. (Biscuits are, of course, only one item which must be offered by supermarkets if they are to maintain the support of their customers. As numerous witnesses testified, there is intense competition for supermarket shelf space, between products and between brands.) No doubt it is true that, if another biscuit supplier considerably expanded its range of products and its volume of sales, the supermarkets would increase the proportion of shelf space allocated to that supplier's products. But given the significance of supermarket sales in the total volume of biscuit sales, such a supplier is in a classic 'Catch 22' situation: it cannot obtain more shelf space until it increases its product range and sales volume, but it cannot increase its product range and sales volume until it increases its shelf space. Perhaps the shelf space advantage is not necessarily permanent. Over a lengthy period of time another supplier might gradually increase its range and sales volume, and so chip away at

Arnotts' 50% shelf space. But Arnotts' incumbency of shelf space is a major obstacle to full-blooded competition, and so a barrier to entry.

Notwithstanding all of these matters, counsel submit that the evidence of active competition between biscuit suppliers necessarily negates dominance. There is no doubt that other suppliers do compete against Arnotts in an attempt to take away some of its market share, although, as his Honour observed, with scant success. But counsel say that the degree of success does not matter; the will is all. They refer to a passage in *Trade Practices Commission v. Australia Meat Holdings Pty. Ltd. & Ors* (1988) ATPR 1140-876 at p. 49, 465; (1988) 83 A.L.R. 299 at p. 337 wherein *Wilcox J.* adopted a test of domination suggested by Dr Geoffrey Walker in an article 'Control or Dominate a Market: Development in Australian Merger Law', (1979) 24 Antitrust Bulletin 371. Dr Walker suggested that an enterprise

> 'is in a position to dominate a market when there is a probability that the other enterprises in the market will act in a way calculated not to affect adversely the dominant concern's short term interests.'

The test of unwillingness effectively to compete was relevant to *Australia Meat Holdings*. On the factual findings, that would have been the situation in the north Queensland cattle market if the merger had proceeded. But this test was not put forward as an exhaustive test of dominance. Indeed, *Wilcox J.* suggested the following statement of principle:

> 'If the size or strength of a particular entity is such that, in practice, other entities are *unable* or unwilling actively to compete with it in a particular market, that entity is dominant in that market' (emphasis supplied).

In the present case, others do compete with the firm alleged to be dominant. But, no doubt because of the matters we have discussed, they have been unsuccessful in reducing Arnotts' 65% market share. Despite their best endeavours, other biscuit suppliers are unable to compete with Arnotts across its range of products.

The appellants' argument that the major supermarket chains exercise such power as purchasers of biscuits that they preclude any supplier acquiring dominant market power may be disposed of shortly. *Beaumont J.* dealt with this matter in para. 15 of his principal conclusions. Nothing has been put before us to suggest that the findings set out in that paragraph were wrong. It is true that the evidence suggested that, whilst Arnotts strove to obtain terms of trade with the supermarket chains which would ensure the allocation to Arnotts of shelf space in a 'corporate block' which was commensurate with its share of sales, Arnotts was not always successful in obtaining and preserving such a share of shelf space. For example, Coles Myer has an immediate interest in securing what it regards as suitable space for its own 'Farmland' range of biscuits.

On the other hand, Mr I.C. McClellan, a senior executive of 'New World', stated that his company recognised that, if it were not to stock Arnotts biscuits, this would have 'an enormous impact' on sales; given the brand loyalty of customers, they would go to competing supermarkets to make their purchases of Arnotts biscuits. There was evidence to like effect from other retailers. There was also evidence that Arnotts was less flexible in its trading and promotional terms, and in its delivery arrangements, than its competitors. Yet the supermarkets tolerate those demands because of Arnotts' market.

Source: *Australian Trade Practices Reports,* vol. 12, para. 41–061, pp. 51,787–93, 1990, CCH, North Ryde, NSW.

Mergers and acquisitions

Reading 11.3

Bureau of Industry Economics

Throughout the 1980s there was increasing public interest in the effect that mergers and acquisitions were having on the economy. Some observers suggested that too many mergers and acquisitions were taking place and that any efficiency gains resulting from greater firm size were not large enough to offset the losses arising from weakened domestic competition and increased consumer prices.

Finding the right balance between the gains and losses from mergers is not an easy task. This report is an attempt to highlight the issues involved and to assess the extent to which four mergers and acquisitions have affected the outcome in their industries.

The report also provides data on trends in merger activity in recent decades and trends in industry concentration.

Introduction

This report examined the effects of mergers on the Australian economy. The emphasis was on horizontal mergers but features of other types of merger activity were discussed where this was considered appropriate.

There were two main issues for examination:

- The effect of mergers on the productive efficiency and international competitiveness of Australian industry (the industry policy objective); and
- The effect of mergers on competition in Australia (the competition policy objective).

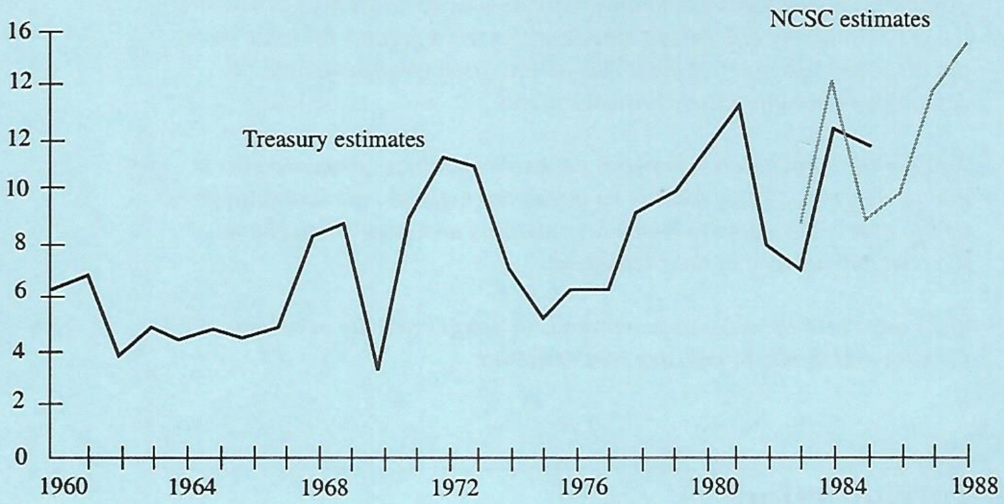
There is potential for conflict between these two policy objectives.

At every stage of the research there were difficulties in obtaining reliable data. This qualification must be borne in mind when the results obtained are being considered. The limitations of the data mean that the results are not as robust as they ideally would be.

Trends in merger activity

Associated with these two policy objectives is an interest in what has been happening to the level of merger activity and the implications of these trends for the structure of Australian industry. Because no precise data on the levels and trends in merger activity are available, they had to be estimated. Proxies used by a number of researchers and by the BIE have enabled a picture to be built up of trends over the last four decades. Figure I presents the data on takeover bids (regardless of their outcome) compiled by the Treasury and the national Companies and Securities Commission (NCSC). It shows a long term growth in merger activity, punctuated by sometimes large fluctuations. It also shows a change over time in some of the characteristics of merger activity.

Figure 1: **Number of takeover bids as a percentage of listed companies, 1960 to 1988**



Source: Research Report 36.

Mergers and industry concentration

Growth in merger activity could be expected to influence industry structure but, because merger statistics are not available on an industry basis, it is not possible to relate changes in industry concentration to changes in industry merger activity. At an aggregate level, as is shown in Table 1, the concentration statistics adjusted for the effects of trade show only moderate growth over the period 1972 to 1986. This is in line with overseas experience.

Even if reliable industry concentration statistics were available, they would have many problems as indicators of the effects of mergers on industry performance. One of the most important is that the relationship between mergers and concentration is unclear. Furthermore, while concentration statistics provide information on the structure of an industry, this structure need bear little relationship to the behaviour of firms in that industry.

Table 1: **Average concentration (a) for the manufacturing sector, 1972–73 to 1986–87**

Unadjusted (b)	1972–73 %	1977–78 %	1982–83 %	1986–87 %
Unweighted	53	56	57	58
Weighted (d)	46	48	48	50
Trade-adjusted (c)	1972–73 %	1977–78 %	1982–83 %	1986–87 %
Unweighted	46	48	49	49
Weighted (d)	45	49	49	51

Source: Research Report 36.

Notes:

(a) That is, percentage of total turnover and trade-adjusted turnover accounted for by the largest four enterprise groups in each 4-digit ASIC industry. Estimates have been made for a number of ASIC classes where data are unavailable.

(b) That is, using turnover data only.

(c) That is, using turnover adjusted for the effects of trade.

(d) Using fixed 1986–87 weights based on industry share of total manufacturing turnover and trade-adjusted turnover respectively.

Case studies of selected mergers

Because of the inadequacies of the available data a case study approach was developed to examine the effects of mergers on firms and industries. Three industries in which mergers have taken place in the last decade were examined in considerable depth. The approach adopted was to examine the expectations for the merger that were held by the acquiring firm at the time of the merger and to compare them with the subsequent developments in the industry. In order to allocate some of these subsequent developments to the effects of the merger, however, it is necessary to know what would have happened in the absence of the merger. Two comparisons were, therefore, necessary:

- the expected benefits with the realised benefits;
- what has happened with what would have happened in the absence of the merger, that is, the counterfactual.

The industries chosen were roof tiles, where two mergers were examined, pastry products, and automotive batteries. These represent a quite diverse range of industry characteristics. The mergers were:

- Boral's acquisition of Blue Metal Industries, including the Clark Tiles subsidiary, in 1982;
- the acquisition by Monier of Wunderlick terracotta tiles in 1983;
- the acquisition of Herbert Adams by Petersville in 1986;
- the acquisition of Chloride Batteries by Pacific Dunlop in 1985.

The impact of the mergers

Despite the differences, the outcomes of the mergers have been remarkably similar. In each case it was not at all clear that the merger made a great deal of difference to the structure of the industry in the long run or to the degree of competition faced by the firm in the industry. There have been many changes in demand and supply conditions affecting the structure of the industry. The impact of the mergers appears to be relatively small in comparison with all these other factors.

Since the roof tiles mergers, for example, on the demand side there has been a shift away from concrete tiles towards terracotta tiles and steel roofing. On the supply side there has been a new entrant in the terracotta tile market, new terracotta tile technology, advances in steel roofing technology and a broadening of the geographic boundaries for roofing materials as transport costs have fallen. Few of these factors could have been foreseen at the time of the mergers, yet each has had a substantial impact on the structure of the industry, the pricing and other behaviour of the firms in the industry, and the degree of competition faced by firms in the industry.

Moreover, the Monier/Wunderlich merger was possibly the least costly means of allowing Wunderlich to leave the industry.

Only in the pastry products industry did the merger have any widely acknowledged direct impact on the behaviour of firms. The merger was seen in the industry as an attempt by Petersville to become more efficient. This has put pressure on other firms to improve their own productive efficiency.

It is arguable, however, that changes similar to those now occurring in this industry were inevitable and that the merger merely brought forward this adjustment. The industry was facing low growth in demand for fresh products and several firms had been in difficulty for some time. Had the merger not occurred, it is likely that one or more of these failing firms would have left the industry, leaving the way open for the remainder to increase their market share and their productive efficiency.

Similarly in the batteries industry, the trend towards larger plants and increasing imports was making change in the structure of the industry inevitable. The merger between Pacific Dunlop and Chloride brought these adjustments forward, possibly making the adjustments more efficiently than would otherwise have been the case.

Were the merger expectations achieved?

The main benefits expected by the firms to arise from the mergers were in the form of economies in production, distribution and administration. These expectations were not always fully realised, mainly because of the unforeseen changes in market conditions noted above. Changing demand patterns, changes in technology, changes in barriers to entry and increasing competition from imports all had an impact.

The effects of these unforeseen changes was least apparent in the automotive batteries industry, where the technology and the demand patterns were well established and have changed little since the merger. Nevertheless, imports have increased and a new domestic producer has become established in the period since the merger.

Another reason expectations were not always achieved was that the firms appear to have been overly optimistic or underestimated the difficulty involved. All the mergers have taken longer than anticipated to settle down. The roof tiles mergers were the easiest in this respect as only administrative and marketing changes occurred. Nevertheless, it was more than a year before the operations of Monier and Wunderlich were fully integrated. In pastry products, the plant from one factory had to be moved to another site and integrated with existing equipment. In batteries, a factory had to be closed and another refurbished and two quite different distribution networks integrated. In pastry products it has taken three years and in batteries it took at least two years for the operations to begin to provide benefits.

All the merged firms, except Boral, have had to undertake considerable investment since the merger to begin to achieve the expected benefits. Much of this investment has been unanticipated. Monier, for example, upgraded the technology at the Wunderlich plant to an extent that it had not considered would be necessary before the merger. Pacific Dunlop had not anticipated that it would need to refurbish completely the Chloride factory. Nor had it anticipated that it would make another acquisition, the GNB Corporation, for it to achieve its expectations in the US.

The mergers and productive efficiency

No precise measure of changes in the productive efficiency of the operations of the firms was possible because of the inadequacies of the data. The estimates that were made support the findings outlined above, that is, it was found that there was a substantial lag between the merger and any apparent increases in productive efficiency and that other factors have had at least as great an impact on productive efficiency as the mergers. For example, the greatest increase in productive efficiency was in the automotive batteries industry but a major cause of this increase appears to have been competition from imported batteries.

The mergers and market power

Indications of changes in market power since the mergers were sought from other industry participants, and customers and suppliers of the merged firm. The overall impression was that any change in the market power of the merged firms since the mergers has been towards a reduction. As was noted above, changing demand patterns, changes in technology, changes in barriers to entry and increasing competition from imports have all worked to reduce any market power the firms might have gained from the mergers.

One of the implications of the automotive batteries case study is that a reduction in barrier protection can have a considerable impact on both the degree of competition in the domestic market and the productive efficiency of domestic firms in traded goods industries. The trade-adjusted concentration data also suggest that import competition can have a significant effect on industry structure.

Conclusions

To sum up, two main points arise from this study. Firstly, mergers are just one of the many forces acting on industry structure and the degree of competition. The impact of mergers in the industries studied appears to have been relatively minor. In particular, the automotive batteries case study showed that import competition can play a role in minimising market power and inducing increased productivity in a traded goods industry with few domestic competitors. Secondly, for the same reason, expectations about the effects of mergers which are made at the time of the merger are unlikely to be fully realised. So many of the forces which will affect industry structure cannot be foreseen by the firms involved.

The major implication for competition policy appears to be that claims regarding expected benefits made at the time of the merger should be treated with considerable caution. Similarly, estimates of potential costs in terms of increased market power are also likely to be wide of the mark.

For industry policy, the case studies suggest that mergers may not produce all the efficiency benefits expected. They may generate benefits to the economy by bringing forward inevitable changes in industry structure but there are many other factors which influence the international competitiveness of an industry. One of the most important of these factors is the presence of competition in the domestic market and in the case studies the main influences on competition were found to be changes in demand patterns, changes in technology and changes in barriers to entry.

Source: *Bulletin of Industry Economics*, no. 8, October 1990, pp. 18–23.

Privatisation in the United Kingdom: Lessons for Australia

Reading 11.4

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Introduction

Although the Australian privatisation process has crept along at a snail's pace in recent years, with the recent change of Federal government, it is set to accelerate. Meanwhile, the British privatisation process has almost exhausted itself, with the recent sale of the rail system and the impending sale of the nuclear generators marking the end of the line. Moreover, the prospect of a change to a Labour government with the next election in the UK, combined with a range of new controversies in the privatised industries relating to mergers, profits and performance, have produced a number of proposals for substantial modification of the predominant price-cap regulatory regime.

With these developments in mind, it seems a good time to review the British privatisation process and its 'lessons' for Australia.

The structure of this paper is as follows. The first section discusses the issue of mergers (and takeovers) among privatised companies and the implications for regulation. The second section discusses the issue of profit levels in a regulatory system where the essential focus is on prices. The third section discusses the issue of quality consideration in such a regulatory system. The paper ends with a brief set of conclusions.

Section 1: Mergers and Takeovers

In the process of privatising vertically-integrated public monopolies in the UK it was in some cases thought beneficial to separate vertically the monopoly's activities and privatise these separated activities. Probably the best example of this in the UK is the electricity industry where there now exists separate private companies at the generation, transmission and distribution levels. Although there is considerable economic literature about efficiency gains from vertical integration, in cases such as electricity, countervailing arguments about competitive structures for efficiency gains seem to have won out.

However, a recent development which has raised a difficulty for the electricity industry regulator in the UK has been the proposal for vertical integration (either by merger or takeover) between privatised generators and distributors in the industry. Clearly privatisation has not eliminated the potential for efficiency gains which can be converted into extra profits associated with even partial vertical integration in the industry. And the private companies involved are potentially only reacting to these efficiency gains, despite balancing concerns about enhanced market power associated with any such vertical integration (Vickers 1995).

In the first instance, it would seem that the pre-privatisation balance of argument in favour of a more competitive structure still dominates politically and the recent proposals for vertical integration have been rejected by the Government. However the potential benefits from vertical integration remain and with plans to deregulate the electricity industry in April 1998 it would seem that it is just a matter of time before vertical integration once again becomes a reality in this industry. Would it perhaps have been better to accept the pressures for (and benefits of) such restructuring and instead maintain an element of regulation to protect consumers from any associated problems of market power?

A different situation altogether exists in the context of horizontal integration with the outstanding example being the formation of United Utilities from Norweb (electricity) and North West Water. Although this merger elicited some consumer concerns about market power, it is difficult not to see clear administrative, managerial and even service efficiencies to be gained by the horizontal integration of the regional providers of such basic household facilities. In fact the benefits of this type of geographically-focused horizontal integration represents an argument against my previous complaint that dividing a national monopoly into small regional monopolies simply sacrifices economies of scale.

In Australia's case the restructuring and privatisation of Victoria's electricity industry is similar to the UK model, as is the separation of the transmission and distribution of gas in Western Australia. Therefore subsequent pressures for the vertical integration of privatised components of such industries should be expected and the industry regularly concerned would do well to be prepared for this eventuality. Perhaps more importantly, in industries where the privatised structure is yet to be formulated, the issue of the benefits of vertical integration versus market power needs to be carefully considered. Similarly, in related industries such as water, electricity and gas, the potential benefits of horizontal integration at the regional level should be taken into account in the process of planning for privatisation.

Section 2: Profits versus Prices

The adoption of RPI-X (now referred to as price-cap) regulation by the British Government in 1984 seemed to represent a clear departure from the traditional focus on profits associated with rate-of-return regulation.

Instead the focus was to be on prices, with the expectation being that this would encourage cost efficiencies. However, with the passage of time the profit performance of some of the privatised companies has been so impressive that widespread concern has developed over the effectiveness of the price-cap regulatory system. Note that this concern is not in reaction to the incentive effect for cost efficiencies, but rather in relation to the regulatory's ability to pass fair measure of the gains from such efficiencies onto consumers by way of the setting of the price-cap. As a consequence, in several cases (e.g. BT) the regulators have instigated accelerated price-cap reviews in order to 'tighten' the price constraint for the benefit of consumers.

But this reaction by regulators has led several commentators to suggest that, in effect, price-cap regulation is simply another form of rate-of-return regulation, with the main difference being the amount of time between profit- based reviews of the regulatory constraint (Liston, 1993). Moreover, this criticism, combined with continued consumer concern about profit levels, has prompted discussion of possible modifications to the price-cap regulatory system which will allow a more explicit account to be taken of the role of profits in the regulatory process (Viehoff, 1995).

Probably the most prominent form of modification suggested in such debates is that of 'profit-sharing' (Mayer and Vickers, 1996). In this situation, not only would the privatised company be subjected to a pricecap, but the regulator would also set limits on the extent to which the company could make profits without requiring some of its profits be 'shared' with its customers. Moreover, this profit constraint could either take the form of a 'sliding-scale', in which case only a proportion of profits in excess of a critical level must be returned to customers, or take the form of a profit-cap, in which case all profits in excess of such a level must be returned. Note also that the method of returning profits could either be by a subsequent tightening of the price-cap or a lump sum payout to customers at the end of the accounting period (Fraser, 1996a, b).

This proposed modification to the price-cap regulatory system has been to a large extent adopted as policy by the Opposition Labour Party in the UK, and with current political standings, looks likely to be implemented after the next election. Despite the understandable complaints of the privatised companies that the introduction of explicit profit-sharing into price-cap regulation represents a changing of the rules after the game has started, there is little doubt that the asymmetric information problem associated with price-cap regulation has made the regulators vulnerable to criticisms regarding excessive profits. Moreover, there is little doubt that these regulators have responded to the political pressure associated with such criticisms by implicitly taking account of profits in their regulatory reviews. Consequently, in the interests of clarifying the operation of the UK regulatory process, it seems appropriate to make the role of profit levels in this process explicit by incorporating the sort of profit-sharing modification proposed. Nevertheless, note that such a modification leaves unresolved the issue of a privatised company's incentive to achieve cost efficiencies.

From Australia's point of view, where price-cap regulation has already been introduced, regulators should anticipate negative customer perception of privatised company profit levels, and perhaps move explicitly rather than implicitly towards acknowledging the role of profits in the regulatory process. And in situations where price-cap regulation is proposed, the Government would do well to take account of developments in the UK in relation to profit-sharing modifications of price-cap regulation.

Section 3: Price versus Quality

The notion that when consumers purchase a good they are in effect purchasing a bundle of characteristics has a long history in economics.

However, in the case of basic household facilities such as electricity, gas, water and telephone, this bundle of characteristics is small, which has the advantage that regulating the price of this type of good is a relatively precise way of protecting consumer interests.

Nevertheless, it is still that case that, even with these goods, the privatised company can take actions which enhance profits to the detriment of consumers. In these situations the characteristic of the good which suffers is the quality of supply and the profit-enhancing actions are typically straight forward cost-cutting procedures such us shutting down relatively expensive plant and reducing employment of service staff. Following these actions the manifestation of a decrease in the quality of supply can take a variety of forms depending in particular on the good. But, for example, in the case of electricity it could take the form of decreased reliability (i.e. increased number of blackouts) or increased time to correct service faults (Fraser 1994a).

A prominent feature of customer complaints in relation to privatised companies in the UK has in essence been regarding a decline in the quality of supply. Moreover, the juxtaposition of record profit levels with record levels of customer complaints (e.g. British Gas) has served to emphasise for regulators that controlling price does not fully protect consumers from exploitation by a private monopoly.

This issue has also fuelled debate in the UK over the future of the price-cap regulatory system. Should the regulatory device be modified so as to include a quality of service dimension or should the regulator support a restructuring of the industry to encourage competition and to further weaken monopoly power? The UK answer as evidenced by the case of British Gas appears to be to encourage the development of competitive forces in as many contexts as possible by deregulation and the fostering of new entrants. But this approach nevertheless leaves a residual core of 'natural monopoly' activities of privatised companies which must continue to be regulated for the protection of consumers. Moreover, introducing a quality of service component to this regulation is easier said than done, particularly in terms of the trade-off between price changes and quality changes in the regulatory formula (Fraser, 1994b).

In this context, it is interesting to note the comments of Abraham (1993) in relation to the regulation of Telstra by AUSTEL that, as of July 1993, the version of price-cap regulation used 'includes a quality of service provision which allows AUSTEL to judge the price of a service to have increased if the quality decreases' (p. 7), although there is no indication as to 'how AUSTEL might value the reduction in quality or determine the change in quality which might be deemed to have met the price-cap given the variation to the prices of other services' (p. 8). Given that weakening the monopoly power of privatised companies by introducing competition is likely to be more difficult in Australia than in the UK because of the relative size of the two economies, it would seem that the development of a regulatory device which fully protects consumers from exploitation by private monopolies should be encouraged. Moreover, since the process of corporatisation of many soon-to-be privatised public enterprises should have involved the setting-up of a range of quality of service indicators, developing a regulatory formula which includes both price and quality of supply may not be as difficult as the comments of Abraham imply.

Conclusion

Looking back over this discussion, the main 'lessons' for Australia are:

(i) Merger and takeover proposals among privatised companies should be anticipated in the process of developing structures for to-be privatised industries;

(ii) proposals for vertical integration in the same industry should be viewed with greater caution than proposals for horizontal integration of regional companies across industries;

(iii) because of negative consumer perception of profit levels among privatised companies, the role of profits should be explicitly acknowledged in the regulatory process;

(iv) the potential for resolving consumer-company conflict over profit levels by the inclusion of a profit-sharing element in the regulatory constraint should be considered;

(v) in the absence of any regulatory control over quality of service, costcutting activities by privatised companies will feature a mixture of genuine cost efficiencies and reductions in the quality of service;

(vi) in situations where competition cannot be used to protect consumer interests, the regulatory constraint on a privatised company with monopoly power should include a quality of service component.

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Source: *Economic Papers,* vol. 14, no. 4, December 1996, pp. 14–19.

Privatisation of prisons

Reading 11.5

R.R. Miller & R.P. Fisher

Many local and state governments are turning to the private sector for the provision of selected public goods. The trend towards privatization has been a rocky road, but as more demands for public sector services compete with limited tax revenues, governments have turned increasingly to the private sector for relief. Prisons offer one example of the potential benefits of privatization.

The war on drugs and harsher prison sentences in the United States during the 1980s resulted in overflowing federal prisons and significant incarceration costs. Building a prison now costs $50,000 per bed and operating it costs $25,000 per inmate per year. As a result, federal officials want to know if private firms can do the same job at a lower cost.

Since 1980, Florida, Kentucky, Louisiana, New Mexico, and Texas have either opened privately operated prisons or contracted with private firms to operate prisons. Table 17.1 summarizes the extent of privatization in these 5 states. In addition to these efforts by state governments, 16 local governments have private jails. The city of Detroit has the largest, a 400-bed private facility. At the federal level, however, private firms have been contracted only to run centers for noncitizens and unsentenced offenders.

Table 17.1: State Private Prisons

State	Number of Facilities	Private Capacity	Total Capacity	Percent Private
Kentucky	3	1,000	8,289	12.1
Louisiana	2	1,220	17,257	7.1
New Mexico	1	200	3,034	6.6
Texas	4	2,000	40,789	4.9
Florida	1	1,000	39,999	2.5

Audited results from several of the 5 states show that the private firms provide prison space at a lower cost than public prisons. Table 17.2, on page 706 [sic, p. 2], shows these results for 8 different facilities in 4 states. Cost savings for private firms exceed 10 percent in every facility except St Mary's in Kentucky. The states generally anticipate savings of this magnitude. In Texas, Louisiana, and Florida, for example, cost savings of

10 percent are written into contracts with private firms. In Louisiana it is estimated that privatized prisons saved the state $5.9 million over a 5-year period. In addition to operating savings, some state officials believe private firms lower the time costs of constructing prisons, particularly when new prisons are required by court order. In New Mexico, for example, it took only 9 months to build a private women's prison when it was expected to have taken the state 3 years.

Table 17.2: Government Versus Privately Operated Per Diem Prison Costs

Private Facility	Government Per Diem	Private Per Diem	Private Savings (%)
St Mary's, KY	$28.00	$26.89	4.0
Beattyville, KY	32.00	26.89	16.0
Grants, NM	80.00	69.75	12.8
Winnfield, LA	29.50	26.00	11.8
Cleveland, TX	42.53	35.25	17.1
Venus, TX	42.53	35.25	17.1
Kyle, TX	42.53	34.79	17.2
Bridgeport, TX	42.53	34.79	17.2

The exact cause of these savings is not known. We can speculate that the private sector can manage employee absenteeism, turnover, and general shirking in a more effective manner than the public sector. Whatever the reason for these gains, they indicate that the private sector can reduce the social losses caused by inefficient public sector production.

Although the experience of these states shows that private firms can operate prisons at a lower cost than the government, other states have been reluctant to privatize their prisons. Some states believe that the private prisons offer a lower level of safety and service compared with government-run prisons, although there is no clear evidence that this is actually the case. Other states are waiting for better information on cost savings. Obviously, cost savings at any level suggest that privatization—at least in prisons—is a way to improve the efficiency of the economy.

Source: Miller, R.R. & Fisher, R.P., *Microeconomics: Price Theory in Practice,* Harper Collins College Publishers, New York, 1995, pp. 704–6.

International trade and global markets

Topic 12

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Introduction

So far in this unit we have concentrated our analysis on the operation of firms and government policy from the perspective of an economy without international transactions. This is a very partial view of the economy as Australia is heavily involved in international markets. Most firms are linked to international markets through their role as either exporters or importers or alternatively through the competition they face from imports. As such they are concerned about what happens to the value of the Australian dollar and what strategy the government takes on import competition.

In this topic we complete the picture by studying how the Australian economy is linked to the rest of the world and how these linkages impact on the operation of firms. We will address the controversial topic of whether Australia should adopt a free trade policy, and provide an economic perspective on the notion of a level playing field. We will also analyse the operation of foreign exchange markets.

Objectives

On completing this topic you should be able to:

- distinguish between comparative and absolute advantage;
- analyse the sources of gains from trade;
- assess the welfare impact of tariffs, quotas and other trade barriers;
- explain how exchange rates are determined; and,
- describe the impact of exchange rate changes on firms involved in international trade.

Learning resources

Prescribed text

Begg, D., Fischer, S. & Dornbusch, R. 2000
Economics
6th edn, McGraw-Hill, London, chapters 33 & 34.

Readings

Reading 12.1
C. Hamilton
'Does free trade produce the goods?'

Reading 12.2
A. Lloyd
'Protection policy, flat earth economics and level playing fields'

Pattern and trends in Australia's international trade

By international standards Australia has a small, relatively open economy. In 1995/96 we exported $98 billion of goods and services or 23% of GDP. For the same period we spent $100 billion on imports and had a net capital inflow of $20 billion (Reserve Bank of Australia 1996, Table G10). Australia's exports are important to the Australian economy because they provide income to those involved in our export industries and the foreign exchange we need to purchase imports. The pattern of growth in exports and imports is summarised in Table 12.1 where trade activities over the period 1986 to 1997 are measured in real value terms. The data in this table show that the values of exports and imports have tended to grow at similar rates over this 11-year period.

Table 12.1: Exports and imports of goods and services

	Imports of goods and services					Exports of goods and services				
	Average 1989/90 prices					Average 1989/90 prices				
	Goods			Services	Total	Goods			Services	Total
	Consumption	Capital	Intermediate			Rural	Resources	Manufacturers		
Seasonally adjusted						Seasonally adjusted				
1986/87	8 054	8 407	19 503	11 621	47 585	17 246	20 948	5 543	8971	52 708
1987/88	9 002	8 385	21 853	13 362	52 602	16 752	23 431	6 043	10 763	56 984
1988/89	11 822	11 805	25 521	15 913	65 061	15 921	23 747	6 265	11 744	57 677
1989/90	12 178	13 077	26 071	17 169	68 495	15 344	25 876	7 707	11 912	60 839
1990/91	12 045	12 279	24 533	15 891	64 748	16 430	28 939	9 464	12 984	67 817
1991/92	12 868	11 885	26 323	16 081	67 157	18 155	31 470	10 705	13 622	73 952
1992/93	13 735	12 720	29 199	16 269	71 950	18 957	32 265	12 290	14 991	78 503
1993/94	14 371	14 098	31 829	17 236	77 534	20 366	34 444	14 445	16 941	86 196
1994/95	16 450	19 136	36 814	18 912	91 312	19 079	34 873	16 728	19 213	89 893
1995/96	16 868	22 403	38 198	19 403	96 872	20 532	37 542	20 411	20 962	99 447
1996/97	18 808	27 083	41 904	20 704	108 499	23 324	41 157	22 989	21 752	109 262

Source: Reserve Bank of Australia (1997), pp. S125–6.

In comparison to other developed countries, Australia has a heavy dependence on primary product exports. Although Australia no longer rides on the sheep's back, exports from the agricultural and mining sectors still far outweigh exports from the manufacturing sector. Furthermore, a significant proportion of the exports that do come from the manufacturing sector are lightly transformed primary products such as processed foods. From Table 12.1 it is clear that while the value of manufacturing exports have grown significantly since the mid-1980s, they have not exceeded the value of rural exports in any year and are still only equivalent to around 50% of the value of resource sector exports.

The foreign exchange earnings of the tourism sector are included in the services category in Table 12.1. Export income from services have grown at half the rate of that in manufacturing.

The markets for our exports are predominantly in Asia, with Japan taking around a quarter of all our exports. The second largest single market is Korea. This focus is a reflection of the combined impacts of our geographical position, the rapid growth of the Asian economies and our extensive natural resource endowment.

Why trade?

Countries such as Australia do not have to trade to survive. They probably have sufficient resources available to them to produce a wide enough range of goods and services to provide a tolerable standard of living. Trade provides the opportunity for the community to expand its welfare. The process of trade does this by enabling us to benefit from the skills and resources of other countries as well as our own.

The argument for trade between countries is essentially the same as the case for trade between individual states and between individuals in society. Just as it is clear that individuals can gain from specialisation and exchange, it can be shown that countries can also gain from specialisation and exchange. These gains from trade come from differences in the *comparative advantage* of the participating parties.

Comparative advantage compared with absolute advantage

A country has an *absolute advantage* (or competitive advantage) in the production of a good if its absolute production costs are lower than those in other countries. A country may have an absolute advantage in the production of all goods and services, yet it can still gain from specialising in some areas and importing other items. Similarly, a country that has an absolute disadvantage in all goods an services can also gain from trade.

The gains from trade flow from differences in comparative advantage rather than absolute advantage. *Comparative advantage* reflects differences in the relative opportunity costs of potential trading partners rather than absolute costs. The case developed in Section 33-2 of Begg et al. (2000, pp. 556–60) demonstrates this:

> Regardless of a country's domestic production costs or *absolute* advantage in producing goods more cheaply, there always exists an exchange rate that will allow that country to produce at least one good more cheaply than other countries when all goods are valued in a common currency. (Begg et al. 2000, p. 557)

☐ *At this point, read the introduction to Chapter 33 and sections 33-1 and 33-2 in Begg et al. (2000), pp. 554–60.*

Question 12.1

(a) Think about the three key issues of world trade raised on p. 577. How are these issues reflected in Australia's trading position and concerns?

(b) What explanations are there for comparative advantage?

(c) In what areas would you expect Australia to have a comparative advantage? What factors are driving this comparative advantage?

The source of differences in comparative advantage stem from factors like different natural resource endowments and different human capital stocks (or skills). Because these factors are not static, comparative advantage can change over time. For example, countries that once had a comparative advantage in textile production like the UK are now major importers, while other countries such as Indonesia have recently become major exporters.

Australia has traditionally experienced a comparative advantage in the rural and resources sectors. This comparative advantage is driven by the relative abundance of natural resource stocks and relative scarcity of labour in Australia. These natural endowments have been supplemented by the development and implementation of 'world best practise' technology in these sectors supported by active research and development programs (especially in the case of agriculture).

Strategic trade theory and comparative advantage

One of the more significant debates in modern economics relates to the question of how much governments can do to change comparative advantage. *Strategic trade theory* suggests that governments can create a comparative advantage for a sector of the economy through public intervention in that industry and pre-empt competition from other nations. The intervention could take the form of subsidies to facilitate the establishment of new industries, subsidies for research and development, and targeted public investment in the development of human capital. For strategic trade policies to work, the industry must have, or be capable of developing, market power in world markets.

☐ *Reading 12.1 contains a critical review of the free trade case and a discussion of the principles surround strategic trade theory.*

Despite the emphasis in much of the media on the arguments raised by Hamilton in Reading 12.1, they are accorded little weight in policy circles or by most economists. For strategic trade theory to have any real relevance to Australia we would need to have market power in individual markets or have the potential to develop that power through government intervention. About the only industry we have that readily fits this characteristic is the wool industry, and our attempts at exerting our market power in that industry almost bankrupted the industry as a whole. Strategic trade theory principles are probably more applicable to US or European Union trade policy.

Question 12.2

Consider the following data on production in two countries, A and B.

	Hours of labour required to produce one unit	
	Wine	***Cloth***
Country A	***2***	***2***
Country B	***4***	***8***

Assume wine and cloth are the only outputs and labour is the only input.

(a) What is the opportunity cost of producing wine in each country?

(b) Which country has an absolute advantage in the production of wine?

(c) ***Which country has a comparative advantage in the production of wine?***

(d) ***Would it be in the interests of both countries to trade?***

(e) ***What pattern of trade would you expect to develop?***

Barriers to trade

While basic economic theory establishes clearly that trade will enhance the welfare of society, no countries allow perfectly free trade. There are always some government controls or distortions present. Countries such as Singapore are probably closest to the free trade ideal while Cuba is probably furthest away. Even countries like Japan and the USA that are proponents of the market system have substantial barriers to trade.

Barriers to free trade may take a number of forms—here, we discuss tariffs, quotas, subsidies, and some other forms of government regulation that effectively restrict trade.

Tariffs

Tariffs are probably the most visible and obvious barrier to trade. Many countries impose a charge or tariff on imports. This tariff could be charged on the value of imports (an *ad velorum* tariff) or charged per unit imported (a specific tariff). The effect of the tariff is to raise the price of imported items relative to the price of domestically produced goods and so tend to increase the sales of domestic goods relative to imported goods.

The welfare implications of a tariff are illustrated in Figure 33-3 of Begg et al. (2000, p. 563). Prior to the introduction of the tariff, all goods (domestic and imported) trade at the world market price of 2000. At this free market price, domestic supply is Q_s and domestic consumption is Q_d. Imports would be equivalent to the difference between domestic consumption and domestic production, or $Q_d - Q_s$. The introduction of a specific tariff of 400 would increase the effective price of imports to 2400. The impact of the tariff is to:

1. expand domestic production from Q_s to Q_s’ in response to the now higher market price;

2. reduce domestic consumption from Q_d to Q_d’ as consumers find consumption less attractive;

3. reduce imports from ($Q_d - Q_s$) to (Q_d’ – Q_s’) in response to the combined impact of lower domestic consumption and higher domestic supply; and

4. create tariff revenue equal to 400 x (Q_d’ – Q_s’).

In an extreme case the tariff could price all imports out of the market. This would result in all the market being serviced by domestic producers and tariff revenue would be zero.

☐ *Now read sections 33-4 to 33-7 in Begg et al. (2000) for a more in-depth discussion of tariffs.*

Question 12.3

(a) What is the economic effect of a tariff? How does it impact on society?

(b) Does the notion of an optimal tariff (Begg et al. 2000, p. 566) provide any insights into the recent debate about the reduction in tariffs in the car industry?

(c) Why do the authors argue that tariffs are often a 'second best' policy option for government?

Quotas

Quotas restrictions on trade are numerical limits on the quantity of imports permitted to be imported. This constrains total supply, limits consumption and increases domestic prices.

Quota protection is often favoured by industries seeking protection because it effectively guarantees domestic firms a predetermined share of the domestic market. With tariffs the impact on market share is far less certain. The resulting market share of the domestic industry depends on the extent of the tariff, the price elasticity of demand for the product, and the extent to which consumers perceive the imported and domestic items to be substitutes.

Production subsidies

Governments can also restrict imports by directly subsidising the production activities of domestic firms, allowing them to drop their prices to levels that limit import penetration. As you have read in Begg et al. (2000), this form of intervention is often favoured by economists *in preference to* tariffs or quotas because:

- it is visible and shows up in annual government budgets; and
- it does not raise the prices that confront consumers.

Other distortions

There are innumerable government regulations other than tariffs and quotas that can be used to restrict trade. Important examples include plant and animal quarantine restrictions. These measures may have a valid basis but in many countries they have often been used to protect relatively high cost domestic agricultural sectors. It is not uncommon for countries to impose substantially higher quality standards on imports than domestic production. Some countries have even banned the importation of products on the basis of reducing the risk of entry of crop diseases that are already both widespread and of no real economic relevance in their own industries.

Recently there have been suggestions from developed countries that import restrictions should be imposed on imports coming from countries that have lower labour protection standards or lower environmental standards than is the case in the relatively wealthy countries of the west. While the intention of these advocates for restrictions based on environmental and labour standards may not be to protect domestic industries, the effect would be similar to that of quotas or tariffs on imports from developing countries.

☐ *Read Section 33-8 in Begg et al. (2000).*

Can you think of any tariffs, quotas or other forms of restrictive trade policies that directly affect your organisation? If so, in what way(s) is your organisation affected?

The level playing field

One of the major issues raised in the Australian press when the issue of restrictions on trade is assessed is the notion of a level playing field. Economists argue that Australian firms should compete on a level playing field with each other. Protection given to one Australian industry , say motor vehicles, imposes costs on other Australian industries as well as Australian consumers. The costs on other Australian industries are principally the increase in the cost of purchased inputs flowing directly from the tariff, the reduction in export prices stemming from the higher value of the Australian dollar that would result from a restriction on imports and the tendency for an increase in the price of all inputs used in the protected industry due to the expansion in that industry.

Consider the case of protection to the car industry from the perspective of one of Australia's established export industries such as wool. Protection to the car industry means the wool industry must pay more for the vehicles that are used in that industry. More importantly, wool producers also suffer a reduction in output prices as the restriction on car imports increases the value of the Australian dollar and therefore depresses export returns. The protection to the car industry probably results in a larger domestic car industry but it also results in reductions in the size of other Australian industries.

Advocates of a level playing field would argue that all Australian firms should receive the same effective level of protection from the Australian government. While Australia would no doubt gain enormously from a level international playing field, that is beyond the control of the Australian government and another issue altogether.

☐ *Read Reading 12.2 now. It provides a traditional view of the free trade debate and focuses on the concept of a level playing field.*

Reading 12.2 was published in 1991 when there was a raging debate about protection to secondary industry. The debate has rekindled itself around the issue of reductions in protection to the heavily protected car, and textile, clothing and footwear industries. These debates have a timeless quality about them and very little seems to change. The case put by Lloyd (1991) still represents a clear summary of the economic argument in favour of lower levels of industry protection.

Question 12.4

Economists often advocate that if protection is to be given to an industry, production subsidies are a more efficient policy than tariffs and tariffs are a more efficient policy instrument than quotas. Why? (The first part you touched on in an earlier question.)

Why restrict trade?

If the adverse impact of restrictions on trade are well known and the gains from trade so well documented in all basic economics texts, why do nearly all governments choose to restrict trade?

- Firstly, in some cases in some countries restrictions on trade may be welfare enhancing. For example, there may be instances where governments can adopt strategic trade policies that improve community welfare. The potential for this in the case of Australia is limited due to the small nature of the Australian economy and our resultant limited market power in world markets. Similarly, countries that have market power in world markets may gain by using tariffs to manipulate the terms of trade they confront. This is the optimal tariff argument. Governments may also choose to protect certain key industries for defence purposes. They could make the judgement that certain skills and industries need to sustained in the country so they are available in the event of war. Most cases of protection would not appear to fit into the defence category.

- Secondly, while society as a whole loses from trade restrictions, some sections of society will gain. These sections are generally relatively small but they tend to gain substantially from the restrictions. The losers from trade restrictions, while being large in number, generally suffer relatively small individual losses. This means that those who benefit from protection have a large incentive to impose pressure on governments to protect their interests while most people in society have little incentive to invest time and effort in getting governments to remove restrictions.

- Finally, while the impact of trade restrictions is well understood by those who have studied economics, it is not so well understood in the general community. The indirect impact of restrictions in reducing the size of other Australian industries is not widely appreciated and many consumers are not aware of the impact that trade restrictions have on the prices they pay.

What impact do trade restrictions have on the prices you pay for clothes?

What impact do Australian trade restrictions have on the prices you receive for your exported goods?

The fact that these costs are hard to measure doesn't mean that they do not exist.

To be able to answer either of these questions with any precision, you need to have a good working knowledge of how exchange rate markets work, as well as a grasp of the basics of trade policy. The analysis of exchange rate markets is the focus of the remainder of this topic.

Exchange rates

☐ *Read Chapter 34 (Begg et al. 2000) for an overview of the history and theory of international exchange rate markets.*

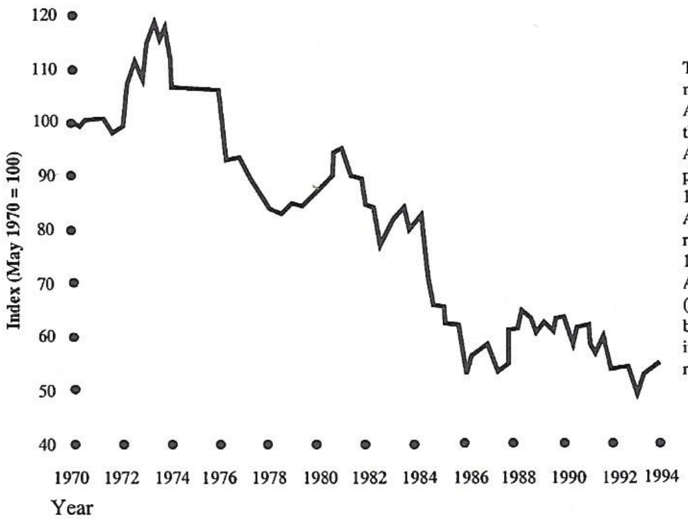
The value of the Australian dollar has been quite volatile around a downward trend since the mid-1970s (see Figure 12.1—the trade weighted index referred to in this table is a weighted average of the value of the A$ against currencies of the countries we trade with and is explained later in this section). These fluctuations in the value of the Australian dollar are potentially important to nearly all Australian companies because they all either sell goods overseas, buy goods from overseas, or buy goods from other companies that buy inputs from overseas. Changes in the value of the dollar changes the effective A$ price we receive for our exports and pay for our imports. A devaluation of the A$ means that the value of the A$ denominated in some other currency has fallen.

For example, if A$1 goes from being worth US$0.80 down to US$0.70, the Australian dollar has devalued against the US dollar. If the A$ goes from Yen 90 to Yen 95, the A$ has appreciated or increased in value against the Japanese yen.

A devaluation of the A$ means that our exporters will tend to receive more in A$ terms for everything they sell overseas and the A$ price of imports will rise. The overall impact is higher domestic prices for Australia.

An appreciation of the A$ has the opposite impact.

Figure 12.1: Trade-weighted index, 1970–94



The trade-weighted index measures the value of the Australian dollar against the group of currencies of Australia's major trading partners. From 1970 to 1976, the value of the Australian dollar was roughly constant. From 1976 to 1987, the Australian dollar weakened (depreciated) against the basket of currencies in the index. Since then, it has remained roughly steady.

Source: McTaggart et al. (1996), p. 746.

Movements in the value of the Australian dollar

In the mid-1980s the Australian dollar fell substantially against many currencies that are used in international commerce, including the Swiss Franc. This was especially important to a number of small to medium sized Australian firms because they had previously taken out 'low interest' loans denominated in currencies such as the Swiss Franc. Firms that had borrowed the equivalent of A$1 million found that when they came to repay the their loans two or three years down the track, they were confronted with repaying A$2 million or more. This resulted in a number of bankruptcies and subsequent legal action by firms against banks for being negligent in not warning their clients about the foreign exchange risks inherent in overseas currency loans.

Even companies that were not involved in raising funds from overseas were affected by the currency swing of the mid-1980s. In December 1985 the A$ would buy just on 208 Japanese Yen. By 1986/87 the value of the A$ had dropped to less than 100 Yen. This means that the cost of imports from Japan potentially doubled over this period. I say potentially doubled, because the actual extent of the increase in price that was passed on to Australian importers in terms of higher prices depended on how much the Japanese exporters chose to absorb and what currency contracts had been written in. If the contracts were denominated in A$, there was no cost implication until the contracts were re-negotiated.

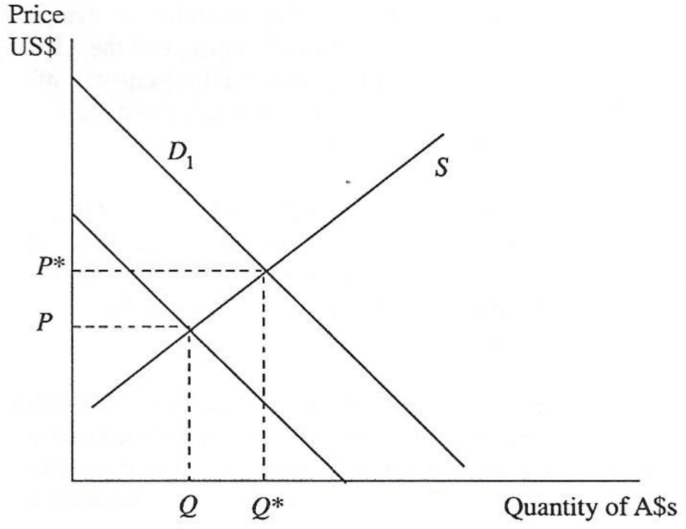
The impact of this devaluation against the Yen (or the Yen's appreciation against the A$) exhibited itself clearly in a huge leap in the prices for Japanese cars in Australia. In a very short period of time Japanese cars went from being amongst the cheapest in each class to the most expensive in some classes. Over this period the Japanese Yen appreciated against the currencies of most of its major export markets. This created particular problems for many established Japanese exporters who were confronted with some difficult strategic choices. At one extreme they could maintain the Yen price of their exports and see volumes drop dramatically, while at the other extreme they could maintain the overseas currency price of their exports and accept dramatic cuts in the effective Japanese Yen price. The optimal actions differed between industries and markets depending on the nature of the price elasticity of demand for the products and hence the effective market power of the Japanese exporters.

While the A$ tends to be more stable nowadays, at the time these notes were being prepared, the value of the Australian dollar fell from US$0.83 to US$0.80 in one day's trading on foreign exchange markets. This means that a firm that was importing goods from the US and paying in US dollars suffered a 3% to 4% cost hike overnight. For example, importers who were bringing in items worth US$20,000 saw the price rise from A$24,096 to A$25,000. These fluctuations can still be very important to companies involved in international trade and finance.

Supply and demand of $A

Up to 1983 the value of the $A was fixed in terms of other currencies such as the British Pound. In December 1983 the value of the Australian $ was floated. This means that the value of the A$ is determined on the world currency markets by the interaction of supply and demand for the A$. As with any commodity, an expansion in demand tends to push the value up while an expansion in supply tends to depress the price. We can portray the market for the A$ in terms of the US$ using a standard supply and demand diagram (see Figure 12.2).

Figure 12.2: The market for Australian dollars



The quantity axis is expressed in terms of A$s while the price is measured in terms of US$. With demand equal to *D* and supply equal to S the equilibrium price is P. This reflects the current value of the A$ in terms of US$s. An expansion in demand to D_1 results in an appreciation in the value of the A$ from *P* to *P**.

The demand for the A$ is determined by the extent of the requirements the world has for A$. The world requires A$s to pay for imports from Australia, to repay loans to Australians, to spend as tourists in Australia and to invest in Australia. The demand for the A$ will be greater:

- the more we export;
- the higher the level of capital inflow into Australia;
- the more overseas tourists spend here; and
- the higher the level of dividend, interest and profit flows into Australia.

The supply of the A$ is a reflection of the quantity of A$s that is converted into foreign currency. The supply of the A$ on foreign currency markets is determined by the value of imports into Australia, the value of expenditure by Australian tourists overseas, the extent of capital outflows and the remittance of income to overseas destinations.

The importance of capital inflows and outflows in foreign exchange markets is reflected in the sensitivity of the value of the A$ to changes in Australian interest rates relative to interest rates in other OECD countries. Apart from their impact on the macro economy, relatively high interest rates in Australia tend to push up the value of the A$ as attractiveness of investment in Australia improves.

While the value of the A$ is determined by the operation of foreign exchange markets, governments often play an active role in moderating market forces. The Australian government, through the Reserve Bank, has often moderated short run falls in the value of the A$ by using its foreign exchange reserves to buy A$s. Similarly when the market is judged to be overheated the Reserve Bank can sell A$ for foreign exchange.

What about exchange rate speculators? They may have no interest in buying or selling goods, or investing longer term in Australia—or even in ever visiting Australia—but they can still influence the value of the A$. If speculators think the dollar is overvalued relative to the fundamentals of the market they will sell it and force the price down. Similarly, if they think it is undervalued they will buy it and force the price up.

Is this activity undesirable? This sort of activity probably ensures the market doesn't depart too far from the basic fundamentals in the long run, but it could be associated with overshooting and instability in the short run. These are issues to be tested through analysis over time and the results are not clear at this stage.

It is also worth remembering that the speculators and the firms involved in imports and exports are often the same firms. Most firms that are heavily involved in the foreign exchange market are concerned to maximise their return from foreign exchange dealings. This often involves speculation in that they make short term decisions on what currencies in which to conduct transactions and hold reserves. This is a potentially risky game but it is widely played by industry.

Nominal versus real effective exchange rates

The individual exchange rates reported in the media on a daily basis are *nominal exchange rates.* They reflect the rate at which one currency can be exchanged for another at a point in time. It is common for the media to refer to the value of the A$ in terms of US$s. This information is relevant if your firm is trading in US$ but may not be particularly useful if you have contracts written in Yen or Francs. The A$ may have risen against the US$ and fallen against the Yen and be stable against the Swiss franc. The exchange rate that your firm is interested in depends on the countries you deal with and currency used to denominate contracts.

Effective exchange rates are indices of a basket of exchange rates. For example, The trade weighted index (TWI) measures the movements in the value of the A$ against a weighted average of overseas currencies. The weights attached to each currency reflect the relative importance of that currency in Australia's trade. Effective exchange rates can be calculated for any individual industry or firm. The International Wool Secretariat publishes a wool weighted exchange rate index which reflects the effective change in the value of the A$ to the countries we sell raw wool.

Real effective exchange rates is an effective exchange rate index adjusted for changes in the inflation rates between Australia and its trading partners. It is sometimes called a competitiveness index because it measures the combined influence of exchange rate changes and inflation rates on the cost competitiveness of our firms that compete in export and import markets.

Question 12.5

Explain what impact the following changes would tend to have on the value of the A$:

(a) growth in exports

(b) lower interest rates in Australia

(c) more Australian tourists travelling overseas

(d) an increase in direct investment in Australia by overseas residents.

Summary

In this topic we reviewed the continuing debate surrounding industry protection from import competition and the case for free trade. In reviewing the case for free trade, we saw how the gains from trade come from the different comparative advantages of potential trading partners. The mechanisms by which different trade restrictions reduce import competition was outlined with particular emphasis on the impact of tariffs.

The new directions in trade theory associated with strategic trade theory were introduced and contrasted with the traditional level playing field view of the issue.

In the final section of this topic we analysed foreign exchange markets and showed how they operated and why they were important to firms involved in international trade and investment.

Concluding comments

This brings us to the end of *Economics for Managers*. In this unit we have covered a lot of economic ground. We have, for example:

- answered the fundamental question ‘What is economics about?’;
- analysed the determinants of market prices;
- evaluated how macro policies impact on firm decisions;
- carefully considered the S–C–P analytical framework;
- given you the ability to analyse such things as business conduct, regulation and privatisation from an economic perspective; and
- placed the operation of the firm in an international context.

We hope that you have found the material challenging, that it will prove valuable to you during your career and, perhaps most of all, that you have gained insight into the fascinating subject of economics.

Review questions

Review question 12.1

Three countries, A, B, and C, are all experiencing relatively high rates of inflation. A floating exchange rate regime is in operation.

Country A wants to reduce the rate of inflation, so introduces a restrictive monetary policy:

(a) What effect does this have on A's exchange rate relative to the other two countries?

(b) How does this affect A's competitiveness?

(c) Meanwhile, back in B and C, what is happening to the inflation rate?

Country B now gets worried about inflation and initiates a tight monetary policy:

(d) What effect does this have on B's exchange rate relative to the other two countries?

(e) Outline the effects of B's policy on Country A.

Review question 12.2

In the 18th century it was widely argued that one country in a trade could be made better off only at the expense of the other country. Explain how is it possible for both countries involved to gain from trade.

Review question 12.3

Explain how the following policy tools restrict trade:

- ***tariffs;***
- ***quotas;***
- ***production subsidies;***
- ***quarantine restrictions.***

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Suggested answers

Topic 12

In-text questions

Question 12.1

No specific answer is supplied for this question. You might wish to discuss parts (a) and (b) with your tutor. Part (c) is discussed in the notes that follow the question.

Question 12.2

(a) A: 1 wine = 1 cloth   B: 1 wine = 0.5 cloth

(b) A has an absolute advantage in the production of wine.

(c) B has a comparative advantage in the production of wine.

(d) The difference in opportunity costs provides the scope for gains from trade.

(e) B would specialise in wine and export wine while A would specialise in cloth and export cloth.

Question 12.3

(b) No, the notion of an optimal tariff only applies when the consuming country has some market power in the market concerned. This means that the level of imports has an influence on the world market price for the good, which means the importer faces an upward sloping supply curve for imports. This is not the case with car imports into Australia. We are price takers in the world car market.

Question 12.4

Quotas provide a given level of market share to domestic industries regardless of how inefficient domestic firms are. They also raise the prices consumers must pay above free market levels.

Tariffs raise prices above free market levels but do not guarantee market shares so they allow for some market pressure on domestic firms.

Production subsidies allow governments to make domestic firms competitive without distorting the prices that consumers confront. That is, prices can stay at free market levels.

Question 12.5

(a) appreciation

(b) depreciation

(c) depreciation

(d) appreciation

Review questions

Review question 12.1

(a) The restrictive monetary policy leads to high interest rates and to an appreciation of A's exchange rate.

(b) Competitiveness declines, deepening the transitional fall in output and employment.

(c) As the competitiveness in A declines, so it rises in B and C, as their exchange rates have depreciated. There is thus some upward pressure on prices.

(d) B's exchange rate now appreciates.

(e) A's exchange rate now falls relative to B and C, threatening upward pressure on prices.

Review question 12.2

In order for two potential trading partners to be willing to trade, they must have different opportunity costs for the traded goods. If they have different opportunity costs and they trade with each other, both parties will gain. The price at which trade takes place must be somewhere between the two opportunity costs. This means that the party with the lower opportunity cost will gain because it will receive a price above the opportunity cost. The party with the higher opportunity cost will also gain because it pays a price below its opportunity cost.

Review question 12.3

Tariffs restrict imports by raising the landed domestic Australian price of imported items; e.g. cars.

Quotas restrict the quantity of imports allowed into Australia to a set quantity level; e.g. textiles and clothing.

Production subsidies make it possible for Australian firms to reduce prices and so out-compete imports on domestic markets; e.g. steel industry

Quarantine restrictions stop imports from countries where there are plant and animal disease risks; e.g. horticulture.

The impact of these policies, with the exception of production subsidies, is to raise domestic price levels. Production subsidies raise tax levels.

Does free trade produce the goods?

Reading 12.1

Clive Hamilton*

Introduction[1]

The doctrine of free trade has had a powerful role in the formation of trade and industry policies in Australia, and its logic has been felt with particular force over the last fifteen years. There is no doubt that the increased exposure of some Australian industries to international competition has brought about substantial improvements in their efficiency and has caused resources to be shifted out of some less efficient industries into those in which Australia can compete on world markets. In recent years, however, uncritical acceptance of the munificence of free trade has come under sustained challenge from the theory of strategic trade policy.

The argument for free trade is based squarely on the textbook theory of comparative advantage. Put simply, the argument is that unfettered competitive markets will allocate scarce resources to their most efficient uses. By interfering in the competitive process, trade restrictions cause resources to be allocated to activities that could better be performed in other countries and draw resources away from activities we are good at. In this way, we produce goods that are relatively cheap and trade them for goods that would be relatively expensive for us to produce. Trading partners thus benefit from exploiting their differences in factor endowments—differences in the skill levels of labour forces, differences in the technologies employed, differences in the amounts of capital available, and differences in natural resource endowments. Competition, by eliminating potential rents and allowing resources to move into industries with comparative advantage, brings about the full benefits of free trade.

In the world of economic theory, it is well established that under competitive conditions free trade maximises economic welfare. However, it is widely recognised that this elegant conception sits uneasily with the messy world it seeks to describe. The discord between theory and practice has asserted itself with particular force over the last two decades. It has done so for three reasons.

First, the nature of international trade in the post-war period has changed. Traditionally, trade has been seen as the exchange of the products of one industry for those of another. Each industry is characterised by a unique mix of factor inputs. However, trade among advanced countries is increasingly dominated by the simultaneous import and export of highly substitutable goods—intro-industry trade. Trade of this type is predicated on product differentiation, quality differences, and the importance of marketing strategies and service backup. The increased prevalence of trade in similar goods means that the role of differences in resource endowments and comparative advantage in determining international specialisation and trade is diminishing.

> Instead, trade seems to reflect arbitrary or temporary advantages resulting from economies of scale or shifting leads in close technological races (Krugman, 1986, p. 7).

A large proportion of international specialisation and trade among advanced countries is based on initial cost advantages gained through large-scale production, or on cumulative advantages due to experience or on temporary advantages due to innovation (Krugman, 1986, p. 8). The consequence of this is that the international division of labour, far from being the product of easily definable economic rules, is in large measure capricious. This fact has some profound implications for economic policy.

The second reason for the disharmony between theory and practice is that the conventional analysis of trade has been challenged in recent years by the new theory of strategic trade policy. It has been known for some years that when the assumptions of perfect competition break down, free trade can reduce welfare. The theory of strategic trade policy draws on recent developments in the theory of industrial organisation—the theory of firm behaviour under imperfect competition—to argue that government intervention in some circumstances can improve a country's income. The purpose of the present paper is to outline the arguments of strategic trade policy and to comment on their relevance to industry promotion policy in Australia.

An inductive argument provides the third reason for the growing dissatisfaction with the standard case for free trade. Several countries that have pursued certain forms of interventionist trade and industry policies have achieved unusually high rates of growth over long periods. The most dramatic examples are provided by the countries of North-East Asia. In the case of South Korea, governments since the early 1960s have pursued a highly protectionist policy aimed at building domestic industry and promoting export growth. This has been an essential component of the transformation of the South Korean economy from a backward, largely peasant-based one into a semi-advanced, highly industrialised one with a dynamic manufacturing sector capable of sustaining large trade surpluses.

In the Japanese case, a strong, diverse and vibrant industrial economy has developed in the context of an array of carefully co-ordinated policies designed to subsidise and protect emerging industries. The essential thrust of the policy has been to protect Japanese companies from foreign competition until they are ready to cope with it. At the same time, efficiency at home has been encouraged through domestic competition.

Business people have always acknowledged that business is done in an imperfect world—a world characterised by collusion and cartels, economies of scale, non-profit public corporations, technological edges, learning-by-doing, risk, inadequate information, non-price factors and the constraints and opportunities provided by government institutions. It makes sense to formulate trade and industry policy on the basis of the way the world actually works, and this is the motivation for new developments in the theory of strategic trade policy. It too uses the process of abstraction to simplify analysis of a complex world. However, the features of the world that it isolates can no longer be regarded as curiosa; they are typical of a large proportion of modern international trade.

Rent-shifting subsidies in imperfect markets

The argument for intervention which receives most attention in the literature on strategic trade policy begins with the observation that many international markets are imperfectly competitive. In these circumstances, a firm in one country may derive rent from consumers in other countries. Market dominance may be based on technological leadership or increasing returns to scale or high start-up costs so that the few firms that establish a lead are thenceforth very difficult to dislodge. The market in question may be for a particular product—such as a new piece of electronic equipment—or for a range of products arising from the development of a generic technology—such as biotechnology or new materials. In order to maintain market dominance and extraction of rents it is necessary for potential competitors to be excluded from the market.

If these conditions prevail, there are substantial advantages to be gained by the countries which perfect the product or establish the industry first. The industries are said to be 'strategic' because the outcome depends on the strategies adopted by the firms involved. It is possible for governments to adopt policies that influence these strategies in ways that encourage early leadership for domestic firms thereby shifting rents to the home country. This is now explained in more detail.

In oligopolistic markets, each firm's behaviour often depends on the decisions taken by its rivals. The development of options for action based on various assumptions about the way rivals respond is known as 'strategic behaviour'. One plausible mode of behaviour is known as Cournot competition. Here, firms maximise profits by choosing their levels of output, assuming *given* output levels of their rivals, so that market prices equalise industry demand and supply.[2]

The profitability of the home firm depends on the size of its market share. If it can find a way of reducing costs then it can expand its market share at the expense of its foreign rivals. Rival firms will be compelled to lower their market shares in the face of this cost disadvantage. As a result, the domestic firm benefits twice. First, it can increase profits as a result of the initial cost reductions. Second, it increases profits by its improved position in the market place as the output of its rivals contracts.

The key point is that from the perspective of the domestic firm a production or export subsidy is equivalent to lowered costs. Its expansion of output is therefore credible to its rivals who thus reduce their output. While the subsidy itself is simply a transfer, the increased market share of the home firm confers a net benefit on the home country.

The essential idea is that governments can use measures which are unavailable to firms, such as subsidies, which influence the strategic games played by firms. In markets characterised by rents, domestic firms can increase their share of the rents if foreign rivals can be persuaded to reduce their output. This is the reasoning behind the complaints often heard in the US that US firms can compete against rival Japanese firms but they cannot compete against Japanese firms in alliance with the Japanese Government.

An example, drawn directly from Krugman (1988), will illustrate the concepts. The example, much loved by strategic trade theorists, is of competition between Boeing and Airbus for the wide-bodied aircraft market. The market would be profitable for either firm alone, but high fixed costs mean that if both produce then both make losses. Table 1 shows some hypothetical pay-offs.

The outcome of this strategic game will be determined by which firm *commits* itself to production first. If Airbus commits itself first, then there would be no point in Boeing entering production since it would make losses (as would Airbus) as illustrated in the top left-hand corner. If Boeing decides not to produce then Airbus will collect all of the profits as in the bottom left-hand corner of Table 1.

Table 1: Pay-offs in a two-firm competition

	AIRBUS			
BOEING				
	Produce		Don't produce	
		-5		0
Produce	-5		100	
		100		0
Don't Produce	0		0	

Now suppose that the US government decides to subsidise production by Boeing irrespective of the decision by Airbus, as in Table 2. It is profitable for Boeing to produce whatever the outcome. If Boeing produces it will be unprofitable for Airbus to produce. The result is that Boeing captures all of the profits, as in the top right-hand corner.

The subsidy to Boeing is simply a redistribution from taxpayers to the company, but Boeing's total profits rise to 110 as a result of the US strategy, of which 100 represents net gains to the USA.

Table 2: Pay-offs in a two-firm competition with a subsidy

	AIRBUS			
BOEING				
	Produce		Don't produce	
		-5		0
Produce	5		110	
		100		0
Don't Produce	0		0	

The scenario envisaged here applies to products or industries which are characterised by very high start-up costs—especially costs of R & D—which results in declining average costs once production begins. There may be room in the world market for three or four producers depending on where the decline in average costs flattens out compared to the size of the market, but the policy argument hinges on the existence of substantial entry barriers. The entry barriers permit the acquisition of rents.

For a small country like Australia, this analysis has limited application. We have few major firms in potentially oligopolistic industries where there are barriers to entry and rents to be earned.[3] While this sort of analysis has not served as a rationale for industry policy in Australia, it is gaining increasing strength in policy debates in Europe and the USA, particularly in response to the perceived use of subsidies on these grounds in Japan. In particular, Japan's MITI is pursuing a vigorous program of support for firms involved in high technology industries, especially through the funding and organisation of research programs involving co-operation among large firms (see Yamamura, 1986).

Economies from protected domestic markets

The argument here is that by reserving the home market for domestic firms, the latter can achieve cost advantage over foreign competitors by way of increased sales. This cost advantage then permits domestic firms to win larger shares of foreign markets and earn extra profits for the national economy. The cost advantage from protection of the home market can derive from one or both of two sources of scale economies—static scale economies and dynamic scale economies due to learning-by-doing.

Yamamura (1986) argues that these sorts of effects were the foundation of Japanese industrial policy in the 1960s and 1970s. Below we consider each before commenting on their influence on industry policy in Australia.

Static economies of scale

The benefits of protection can be illustrated by two stylised examples. In the first case a domestic and a foreign firm compete, perhaps through differentiated products, in a number of markets including the home market. The cost structure of the industry is characterised by declining marginal costs as output rises. Now allow the domestic market to be closed off to foreign producers either wholly through, say, a prohibitive tariff, or in part by, say, government purchasing policy. This act increases the sales of the domestic firm and reduces the sales of the foreign firm. The marginal costs of the domestic firm fall while those of the foreign firm rise. Consequently, the domestic firm can further expand its market share at home and abroad.

A similar, and in practice more important, case arises where there are several firms and entry into the industry is sufficiently free to drive profits down to the 'normal' level. Scale economies are not large enough to eliminate competition. While marginal costs are constant, high fixed costs mean that average costs fall with expansion of output.

The closing of the domestic market to foreign competition allows domestic firms to move down their average cost curves and forces foreign firms to move up theirs. If there are several domestic firms, ensuring a competitive home market, home prices will fall and consumers will benefit. Domestic firms can use their new-found competitive advantage to tackle foreign markets.

Learning-by-doing

Increasing returns to scale may take the dynamic form of learning-by-doing (LBD). LBD is similar in its effects to static scale economies except that time is now taken into account explicitly. The idea is that as a firm gains more experience as a result of producing more over time its costs of production decline. Marginal costs are constant at any point in time but over time they decline as more output is produced.

Protection of the home market allows domestic firms to learn more quickly because their output is higher. Falling costs permit domestic firms to compete more effectively in home and foreign markets.

The significance of LBD is that it contradicts the standard notion that there is a natural pattern of international specialisation and trade determined by given factor endowments (Krugman, 1987). The acquisition of skills on the job and the learning of more efficient ways to produce can have an important influence on patterns of trade and industrial structures. There is nothing pre-ordained about the pattern of international specialisation and trade. The skills and methods acquired through learning-by-doing are not 'endowments', and just as they can be acquired they can be lost. The key is that once a pattern of specialisation is established through learning-by-doing, this pattern becomes locked in. Once market dominance is achieved, dominance is reinforced as long as there are economies to be had from learning.

In some industries, then, closing off the domestic market can accelerate productivity improvement relative to foreign competitors. The home country can remove the protective barrier once this cost advantage is acquired. This process appears to have been important in the Japanese policy of shifting protection sequentially from one industry to another, removing protection when the industry became internationally competitive. This seems to have been the case in the semiconductor industry in which Japanese firms have achieved dominance over US firms through technological development. A third case of economies from protected domestic markets arises when average costs are reduced by prior investment in R & D (see Krugman, 1984). Guaranteed domestic sales increase the incentive to invest in R & D.

In practice, policies based on this reasoning are likely to be more effective if the home industry is close to being internationally competitive and where exclusion of foreigners from the domestic market enlarges the market for domestic firms substantially.

According to this analysis, if protection is removed too soon and market share is lost then foreign firms can gain a productivity advantage that will further rob home firms of market share. Moreover, a transitory set-back to the competitiveness of an industry—due, for instance, to a temporary over-valuation of the currency in a period of tight monetary policy—can bring about a permanent loss of competitiveness (Krugman, 1987). Similarly, the crowding out of the manufacturing sector due to real appreciation of the currency in a resources boom (the Dutch disease) can mean that manufacturing cannot get back on its feet when the boom is over.

Australian policies

For many years, arguments based on static and dynamic scale economies have been employed to secure barrier protection for Australian manufacturing industries. The absence of sufficient domestic competition or the threat of international competition from sunset clauses has often meant that the incentives to take advantage of the potential efficiencies of large-scale production have been absent. In more recent years, industry policies have been designed to put the cost effects of scale economies into practice.

The Automotive Plan aims at rationalising the domestic industry while maintaining protection from imports by taking advantage of economies of scale. Without protection the home industry's share of the market would probably shrink significantly and the opportunity to develop an efficient, more specialised industry may disappear. Whether the productivity gains to be had from rationalisation will be sufficient to ensure an internationally competitive specialised industry is yet to be seen.

State and Federal government purchasing policies are generally designed to encourage Australian industry to become more efficient through the provision of guaranteed markets. The Offsets program has this same goal explicity built into it. Its purpose is to established internationally competitive activities within Australia by encouraging the adoption of advanced technologies and the acquisition of new skills. It does this by giving enhanced market shares to Australian industries by requiring overseas suppliers to the government to undertake high technology, export-oriented activities locally.

As a final example, the industry development program for the pharmaceuticals industry is designed to encourage the local development of products that can compete internationally. The government pays higher prices for products listed on the Pharmaceutical Benefits Scheme to manufacturers who meet pre-determined levels of exports and R & D.

External economies

External economies arise when a benefit from an economic activity flows to firms or individuals other than the firm or individual actually undertaking the activity. Since the firm undertaking the activity cannot 'internalise' these benefits—i.e. appropriate them for private use and sale—the social returns arising from the activity are higher than the private returns. External economies are not dependent on the structure of the market concerned and may arise in perfectly competitive markets.

Some of the most important external benefits are those associated with the generation of knowledge and the acquisition of skills. In the latter case, skills acquired on the job as well as from formal education are not the property of firms but of the workers who possess them. Since these workers are free to move around the labour market, it is often not profitable for firms to invest in the skill base of its workforce as the benefits may accrue in large measure to other firms.

In the case of externalities associated with the generation of knowledge, it is useful to distinguish between applied research and development and more basic scientific and technical research. While the former can often be turned quickly into profits for the firm carrying out the R & D and these profits can be protected through the use of patents, more basic research is not only more risky but the outputs are more difficult to appropriate by an individual firm.

The MITI program of pooling the research resources of firms in the information technology sector is designed to avoid the social losses arising from duplication of research. While research output is 'monopolised', MITI maintains its policy of ensuring competition between Japanese firms in markets for the final products.

In Australian, the Partnerships for Development scheme is based largely on an externalities argument. Large foreign companies in the information technology industry are relieved of their Offsets commitments in exchange for investing in production and research facilities in Australia. The benefits to Australia are thought to derive from spin-off firms and transfer of technology to local firms as well as from providing local firms with the opportunity to break into overseas markets by supplying the foreign majors ('piggy-backing').

Several government policies are operating or are being considered to overcome the problem of externalised benefits. In particular, the present government has proposed a training levy on industry in an attempt to encourage on-the-job skill acquisition. In some industries, firms have responded by establishing their own industry-wide and collectively funded training schemes, so that while the skill base of the industry is increased, individual firms are not disadvantaged. In this way, the skills whose benefits are external to firms but internal to the industry receive the necessary funding.

Nevertheless, there may be a case for subsidising industries which can be identified as generating especially large spillovers through skill transfers particularly when the benefits spill over into other industries.

Retaliation

If it is accepted that subsidies or protective devices can generate increases in national income under certain market conditions, then the question of retaliation must be addressed. If one country can profitably subsidise its firms in an industry, then so can the country with the competing firms. The analysis of strategic trade policy employs game theory to understand the possible outcomes.

The decision by a government to intervene or not will depend on how it expects foreign governments to react both currently and in the future. This can be illustrated most easily in a pay-off matrix such as Table 3 (taken from Brander, 1986). Each competing country, A and B, can do better by intervention (such as a subsidy) as long as the other country refrains from intervening.

In this situation, it will be profitable for each country to intervene whether the partner intervenes or not. There is thus a strong tendency for the outcome to gravitate towards the top left-hand corner.

Table 3: Pay-off matrix for competing countries

	COUNTRY A			
	Intervene		Don't intervene	
COUNTRY B				
		100		50
Intervene	100		500	
		500		400
Don't Intervene	50		400	

The situation represented here of a one-off decision is not realistic since in practice decisions are not irrevocable and at any time there are several policy instruments that can be applied to several different industries. These policy instruments may be 'economic' or 'political'. For instance, US policy makers have advocated reductions in US military support for South Korea if trade surpluses persist. Trade policy is often an arm of diplomacy.

When policies are not once-only or irrevocable, it is necessary to turn to the theory of contingent strategies to make some sense of the options facing policy makers. Here the world becomes very complicated and no clear-cut rules emerge. However, in experiments a particularly successful strategy to adopt is tit for tat. Faced with this strategy being pursued by our competitors we are virtually forced to co-operate (see Brander, 1986). One point, however, is quite clear: if the arguments of strategic trade policy are correct, provision of an unqualified commitment to free trade—through a non-interventionist, unilateralist position—is an invitation to exploitation.

It is clear that in formulating its trade and industry policies, Australia needs to consider the consequences of its actions for the policy decisions of our competitors. In practice, this is done informally and on a continuing basis. If the arguments of strategic trade policy are valid then intervention by our competitors needs to be matched by intervention by us, unless we consider the industry already 'lost'. If we believe that our competitors will not retaliate then it is in our interests to intervene to stimulate selected industries. There may be some advantage in being a small country in this respect. However, through encouraging firms to take advantage of static and dynamic scale economies, the aim of industry policy is to make our industries large in the markets in which they operate.

In the world of trade relations the rule is to advocate free trade and practice protection wherever possible. A common tactic is to advocate free trade in the sectors in which one can compete and protect those that are uncompetitive. The appeal of unobtrusive protective devices such as the use of technical standards and anti-dumping laws to exclude threatening imports lies in the ability of countries to protect while maintaining commitment to their international treaty obligations. The more successful the GATT negotiations are in extracting commitments to liberalisation, the more attractive it will become for individual countries to protect and subsidise through unprohibited measures, whether other countries use these measures or not.

If the current GATT round fails and there is no multilateral commitment to net reductions in trade-distorting policies, the optimal situation represented by the bottom, right-hand corner of Table 3 may best be approached through bilateral agreements. The attraction of bilateral agreements is that commitments to liberalisation and mutual trust tend to be easier to obtain. They also allow agreements to be reached more quickly and these agreements are able to encompass difficult areas such as government purchasing, technical standards and investment laws which inhibit fair trade. The principal disadvantage of bilateral agreements is that the large partner to the agreement can usually exert more negotiating power. Plurilateral agreements may dilute the power of larger partners.

Strategic trade policy in practice

While it may be accepted in principle that national income can be increased by strategic trade policies, the difficulties of implementation may negate the putative benefits. Consideration of these difficulties deserves a paper of itself. First of all, it is necessary to determine the characteristics of industries, or sub-sectors of industries, that make then deserving of support. While in practice each proposal would need to be analysed at a detailed level, some of the broad characteristics of industries that would qualify for support using strategic arguments can be identified. The characteristics cover both the nature of costs and the likely structure of the market.

Targeted industries or products should have relatively large knowledge or research and development requirements which imply long, steep learning curves. In addition, or alternatively, they should have large capital requirements with substantial potential scale economies especially if combined with large technological inputs. These features provide barriers to entry once the product or process is developed. It is essential that start-up costs, including the subsidies provided, are repayable by 'rents' on exports in the future. These requirements imply that products or processes to be targeted should be new. It is an added advantage if there are spillovers to domestic firms in the same or cognate industries—perhaps in the form of transfers of skills—but a disadvantage if these benefits spill over to foreign firms.

It is beneficial if the home country already has some natural advantage in the targeted industry so that each subsidy dollar allows costs to be reduced even further. In addition, factor prices in the targeted industry should not rise in response to the subsidies. There is a danger of skill shortages developing so that skilled labour is drawn away from other industries. In the Australian context, wages are more likely to remain stable during the period of development if there is involvement of trade unions in the targeting decision process and perhaps some institutional profit-sharing agreement.

A final desirable feature of targeted processes or products is that they are not heavily subsidised in other countries.

In Japan, the selection of industries to be targeted is carried out by a council of experts drawn from leading corporations, banks, universities, trade unions and the ministry (MITI)—Carliner (1986). Consensus is an important part of the process. This tends to by-pass the criticism often levelled at specific industry support measures that bureaucrats do not have the information required to pick winners. The political consensus that has emerged in Australia over the last six years would seem to lend itself to the council-of-experts approach.

Moreover, the incompetence of bureaucrats is often overstated. It is not unusual for bureaucrats engaged in industry policy formulation to be recruited into private industry where they immediately begin making decisions about their firm's investments. They do so by drawing on the same information that they had at their disposal while in government service.

There are advantages in providing subsidies as part of an overall industry plan in order to avoid the problem of too many firms entering the subsidised industry. Excessive entry of firms into an activity may dissipate profits by increasing costs; total R & D costs rise as more firms undertake research, and, in the presence of scale economies, costs of production rise as more firms produce. Nevertheless, the plan may include measures, formal or informal, to ensure that the participating firms continue to experience competitive pressure.

Conclusions

There are two types of government support for domestic industry—inward-looking and outward-looking. Post-war Australian industry developed and stagnated under the old, inward-looking form of protection. The new policies based on strategic trade theory and the experience of some of the most successful countries explicitly reject the inward-looking approach. Whereas the old type of intervention reserved home markets for domestic firms which could not see beyond national borders, the new type of intervention is designed to prepare domestic firms to compete with foreign firms in export markets. Whereas the old style of protection served to restrict trade, the new style aims at increasing it by integrating the domestic economy into the world economy. Whereas the old style served to restrict competition and thus the incentives to become efficient, the new style aims at maintaining domestic competition and increasing potential foreign competition while giving domestic firms a temporary respite from foreign pressures while the prepare to contend with the opposition.

The two types of protection reflect two different motivations for providing it. Old-style protection tend to be imposed to preserve the interests of particular groups with political power. New-style intervention in an industry is undertaken because the industry has been identified as one that can become internationally competitive and thus add to national income.

The question naturally arises why, if there are profits to be made from investment in a targeted industry, the industry itself does not undertake the investment without the need for government intervention. The critical insight of strategic trade theory is that in uncompetitive or potentially uncompetitive markets government intervention can change the environment in which business decisions are made. It can influence the market situation faced by firms and the strategic games played by them.

One way that government intervention can change the business environment is to influence the 'resources' that are available to firms in strategic industries. In particular, government intervention can lead to the creation of knowledge and skills that would not otherwise be created. Governments have always done this in a generic way through their support for education systems. Now it is argued that they can very effectively and directly influence the pattern of international specialisation and trade by targeting particular industries which generate these skills and knowledge. Comparative advantage, then, is an inherently dynamic concept, and is determined by the decisions of individuals, firms and governments. The development strategies of countries such as those of North East Asia have been built explicitly on this notion, that is, on an unwillingness to accept their endowments of natural resources as the sole basis for their places in the international division of labour.

The contemporary significance of strategic trade policy is that these considerations—the role of dynamic factors in creating a country's comparative advantage—are becoming increasingly important as determinants of the pattern of international specialisation and trade. The newer industries are increasingly founded not on unalterable resource endowments but on skills and technologies which are being developed in firms, universities and research laboratories now. The scope for gaining competitive advantage from technological breakthroughs, from quality improvements, and from the exploitation of new skills has never been higher and will grow rapidly over the coming decades.

End notes

1 This paper has been improved as a result of comments from John Whiteman, Richard Begley and Ralph Lattimore of the BIE and Miles Jordana of DFAT. Some of them disagree with some of the arguments put forward here and cannot be held in any way responsible for them.

2 An alternative model of firm behaviour occurs when each firm assumes that the prices set by other firms are fixed so that outputs vary to clear the market. This is known as Bertrand competition.

3 The Sarich orbital engine may be an exception. Although the costs of innovation and development have been largely met already, the barrier to entry and the access to rents is assured by the patent on the invention. In addition to considerations of employment and external benefits, the decision to offer subsidies to ensure location of production in Australia should depend on how the location of production is expected to affect the destination of the rents. If the rents accrue solely to Mr Sarich and other Australian investors (and not the workers via wages above market rates) then the rents will flow into Australia no matter where production is located. It might be more damaging if Mr Sarich were to locate himself overseas.

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* Bureau of Industry Economics. Any views expressed here are those of the author and not necessarily those of the Bureau of Industry Economics.

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Protection policy, flat earth economics and level playing fields

Reading 12.2

Allan Lloyd

The 1991 July-August issue of *Quadrant* opens with Hal Colebatch stating that in Australia, 'The case for economic rationalism is largely won'. He then chides the Editor for wasting so much recent space on the non-issue of Free Trade versus Protectionism, 'which has as much intellectual adventure as debating whether the Earth is spherical or flat'. But the Editor, quite correctly, replies that the electorate is anything but agreed, especially the unemployed and those under threat, and the debate must continue. I suggest that the chance of rapid economic recovery in employment is remote, and, in such times, it is likely that flat *earth economics*, which has always favoured tariffs, will flourish even further. To fully implement tariff reform, micro-economic reform, constitutional reform etc, will take many years, and the visible pay-offs will come only gradually, so that the 'political economy' battle on protection policy has yet to be clearly won.

Many of the *Quadrant* contributors who have queried tariff cuts are greatly concerned about growing unemployment and its social effects (eg John Carroll). If I were convinced, as they apparently are, that high tariffs increase total employment, and without seriously depressing living standards, I would join them. One needs little economics to understand the *direct* gain to protected producers from tariffs, and the *direct* cost to consumers (eg the $4,000 per car). In today's hard times, some may consider that a reasonable price to pay to reduce unemployment, especially to those who harbour the delusions that the tariff is simply 'a tax on the foreigner' which helps in 'keeping money in the country'. (Abe Lincoln produced an impressive combination of fallacies when he said: 'I don't know much about the tariff. But I do know that when I buy a coat from England, I have the coat and England has the money. But when I buy a coat in America, I have the coat and America has the money'.)

Thus there has been a resurgence of protectionist sentiment. But the *indirect* costs of tariffs outlined below are largely hidden in the 'market forces' talked about by economists. To the farmers or manufacturers wanting help, and the workers wanting jobs, these indirect effects are 'over the horizon', and only the obvious foreground is perceived. That tariffs create jobs seems as obvious as that the earth is flat. But taking a whole-economy view and tracing through all the effects shows that tariffs merely shift jobs around, generally into less viable activities. Also, we must remember that over the long run, when the balance of payments must balance, reducing imports reduces exports, which means *loss* of jobs. Only a general equilibrium model which captures the interdependence between sectors and economic activities can incorporate these effects.

The anti-protectionists must convince the electorate of the 'tariffs create jobs' fallacies and the indirect costs of tariffs. These arguments are covered in standard texts (eg Samuelson, Baumol) but the new protectionists are either unaware of them or choose to ignore them, which makes for a rather sterile debate.

Recently there have been claims that we have now reduced the average manufacturing tariff to around 8%, leaving the implication that this low figure is nothing to worry about, and further reduction is unnecessary. This is quite misleading.

First, the average *effective* rate of protection (ERP) is nearly double the *nominal* rate, which the Industry Commission Report of 1989–90 estimated as 9.6%.[1] Second, our tariff does great damage because it is anything but uniform—it is *highly variable,* and quoting the average hides this vital fact. Most of our manufacturing and agriculture has little or no protection, and these 'Cinderalla' industries are greatly disadvantaged in several ways by the very high rates given to the 'Ugly Sister' industries. For example, the 1989–90 Annual Report of the Industry Commission shows that ERPs for textiles were nearly 80% in the late 1980s and should come down to 63% by the mid-1990s. For clothing and footwear they were over 120% in the later 1980s and should come down to 112% in the mid-1990s. Motor vehicles and parts were approximately 70%, to be reduced to 57% in the mid-1990s. Of course, following the Government's March 1991 Statement, the mid-1990s number will now be smaller, but will still leave us with large distortions.

Jobs

The 70% effective tariff rate for transport equipment quoted has the *immediate effect* of retaining jobs in the car industry but imposed an average burden of *$4,000 per car* ex factory on consumers in 1988 (slightly smaller now). The total tax on consumers from all tariffs was $11 billion in 1988–89—over $700 per head of population in today's dollars. Furthermore this tax, much of its accruing to the protected producers rather than the Government, is *regressive*—the proportionate burden is highest on low income earners. A few years ago the burden on consumers was equal to a 15% consumption tax and to about half of the income tax revenue. But costs are imposed not only on consumers but on 'downstream' manufacturers—a *second-round effect.* A tariff to raise the price of steel to avoid job losses in steel production hurts those Australian industries which buy steel products—higher costs destroy jobs downstream. And not just 'downstream' manufacturers are hurt. Gregory Clark seems to think that damage to other industries flows only from tariffs on producer goods: 'tariffs on consumer goods simply reduce the disposable income of consumers' (*Quadrant,* May, p. 35). However, a tariff which adds $4,000 to the cost of a car means consumers have $4,000 less to spend on all other goods and services—a *third-round effect.* Further over the horizon is a *fourth-round effect:* the exchange rate is raised by tariff protection, thereby reducing returns to the whole traded-goods sector, both exporters and activities competing with imports, such as manufacturing. An overvalued exchange rate lowers the price of both our exports and imports in $A. Only the heavily protected activities have a net gain after allowing for the exchange rate effect. In short, *creating or retaining jobs in protected industries costs jobs elsewhere.*

Not surprisingly exporters, especially farmers, have for some time been claiming compensation (eg export subsidies) for the reduction in their $A prices and their higher costs. As Fogarty points out, 'since the tariff is a tax on exports, Dr Carroll's claim that it is unreasonable to expect unassisted Australian manufacturers to compete successfully on export markets is a self-fulfilling prophecy' (*Quadrant*, April, p. 60). Furthermore, unprotected and lightly protected import-competing firms could claim (and have claimed) similar assistance on the same grounds.

But to the extent that government heeds this chain of claims (each of which, in isolation, has some validity) and compensates for them, it is conducting a Mad Hatter's Tea Party! Moving towards a uniform tariff and a compensating uniform export subsidy would be a vast and unnecessary political and administrative task, though a huge boost to the lobbying industry. *Protection for everybody is protection for nobody* and that result is achievable more simply by phasing out all unjustifiable tariffs and export subsidies over time, whilst welcoming and assisting the *consequent* devaluation of the exchange rate. Gradually reducing tariffs lowers inflation directly through cheaper imports, and also indirectly through effects on downstream manufacturers (cheaper local steel provides cheaper steel products). To the extent that these benefits were not enough to remove the current account deficit, the foreign exchange market itself would lower the value of the $A. Government intervention may involve wages policy to prevent or reduce inflationary effects flowing through into higher wages. A nominal devaluation of, say, 10% which was allowed to trigger 6% inflation would provide only a 4% real devaluation.

Tariffs are sometimes referred to as 'one-way devaluation', since they raise returns to import-competing firms but not to exporters. But why should even mercantilists prefer that to a devaluation? (C.D. Kemp – in the May issue – whilst objecting to tariff cuts, complains about our currency being overvalued, apparently unaware that high tariffs helped raise our exchange rate and that tariff cuts will reduce it.)

Tariff reformers may have aroused less opposition had they been successful in the very difficult task of explaining to workers and management that the long-run objective is really to *substitute ' exchange rate protection' for tariff protection.* Reducing tariffs lowers inflation directly through cheaper imports, and indirectly through effects on downstream manufacturers (cheaper steel provides cheaper steel products) but the lower values of the $A, would tend to *increase* inflation. Thus the substitution may require a reduction in real wages in the short run—that is until the improved efficiencies are obtained. Appropriate government expenditure policy and wages policy would be required to provide a *real* devaluation. Since devaluation is non-discriminatory it avoids all of the indirect costs of the tariff discussed above, as well as the considerable government cost of administering the tariff, and the adverse 'dynamic' effects discussed below. A large devaluation will achieve what T.M. Fitzgerald (in the May issue) correctly identified as the essential change of 'raising the profitability of the traded goods sector to the point at which it can quickly attract resources out of the non-traded goods sector'.

The role of the exchange rate was one of the many factors overlooked by Kemp (in the May issue) when he said of the Government's March 1991 Industry Statement:

> The Statement visualises a kind of 'brave new world' by the year 2000 in which Australian industry, protectionless, is competing successfully in a presumably free-trade global environment. I find this vision quite unrealistic. Even should all the objectives of the micro-reforms (which are necessary) have been achieved, Australian industry will still be seriously handicapped against its Western competitors by the small home market and its distance from overseas markets, and against its Eastern competitors by its high wages and advanced working conditions.

In fact, the small home market *necessitates* the presence of overseas competition, and the distance from overseas markets provides considerable *natural* protection (that is without government intervention) from imports. The cheap foreign labour argument is exposed in Section 3.

Some of the neo-protectionist arguments advanced depend on *international comparisons* (eg 'Japan is highly protectionist and leads the world in economic growth') or *comparisons over time* (eg 'The Australian situation has worsened ever since Whitlam's 25% tariff cut in 1973').

John Stone (in the May issue) summarised the main reasons for Japan's 'positive economic miracle' without mentioning their trade barriers, *viz* an emphasis on excellence, high rates of saving and thus investment, and a tradition of hard work. I would add a fourth factor—a competitive domestic market, but of course a long list of probable causal factors could be compiled, with no hope of determining the relative contribution of each factor.

Comparisons over time are similarly inconclusive. A long list could be compiled of unfavourable events which followed the 1973 25% tariff cut. In particular, nobody knew that within months the world would experience its worst recession since the 1930s. That did not prevent local protectionists from blaming our own slump on the tariff cuts. Interpreting temporal sequences as causal sequences *(post hoc ergo proper hoc)* is a common source of confusion, and not just in economic affairs. Those who believe that history provides us with clear lessons on protection policy or anything else should read Karl Popper's *The Poverty of Historicism.* As the aphorism goes, 'History is a special case'.

Of course we may well retain a few tariffs and export subsidies for reasons related to defence, social, cultural and economic objectives. There *are* valid arguments for some tariffs in some circumstances.

Thus far I have focused on the 'static' effects of tariffs—the 'distortions' in resource allocation. However, there are additional costs of the tariff over time—the *dynamic effects.* They discourage enterprise and innovation and encourage rent-seeking and lobbying, 'feather-bedding' and 'sheltered workshops'. For decades the old Tariff Board's procedure was to calculate how high a tariff was needed to permit the weakest firms in an industry to survive. (These tended to be the firms wheeled up for examination.) With 'made to measure' tariffs thus available, management and labour have been able to avoid the painful process of *meeting* the overseas competition by improved productivity. All too often they formed an unholy alliance to pressure Canberra to *remove* the overseas competition all in the name of defending jobs. This has been the

Australian disease of the past half-century or so (see N.R. Evans, *Quadrant,* Jan–Feb). These long-run dynamic costs obviously are hard to measure, but it is equally obvious that they could be very large—perhaps larger than the static costs. As Costello sees it (May, p. 49), 'The real evil of protection was the effect it had on infrastructure affecting all industry. Behind the tariff wall all sorts of inefficient and corrupt arrangements grew up', and he proceeds to examples.

What must be stressed is that because scale economies are increasingly important, and our domestic market is small, our protection policy of 'trying to produce everything' has resulted not only in high unit costs but also in lack of competition. Shutting out foreign competition has in many cases prevented any competition, and encouraged 'inefficient and corrupt arrangements'. By contrast there is intensive competition within Japan's huge domestic market, despite trade barriers to overseas competition.

Level playing fields and cheating

The EC, Japan and the USA heavily protect their farmers through tariffs and subsidies, and are seen as 'cheating'. Since the international playing field of world trade is to that extent uneven and inequitable, it is argued that we should retaliate by counter-cheating, that is, by increasing protection to our farmers and manufacturers. This seems to be another proposition whose truth is as obvious as the flatness of the earth. But not only does it ignore the indirect effects outlined above; it employs a quite fallacious 'games analogy'.

In a poker game, the total amount won by the winners equals the total amount lost by the losers—it is what is called a 'zero-sum game'.

Therefore, if your opponent cheats when playing poker, it is in your own interest also to cheat. But many activities, including economic activities such as trade, are positive-sum games. In voluntary transactions, both parties benefit, buyers and sellers, or there would be no transaction.

When we sell beef to Japan and buy their cars, there are large and measurable 'gains from trade', which are shared. That is, each party gains from the superior efficiency of the other party in some activities. Our gains would be even greater if Japan ceased restricting its imports of our beef (which of course limits our imports, including cars). If they refuse, our choices are:

- to negotiate, which may take decades and then fail. (We do not have much bargaining power.) In the meantime we can either;
- maintain trade by continuing to import their cars; or
- retaliate by increasing the heavy tariff we already place on car imports.

If we retaliate, but do not thereby induce Japan to repeal restrictions on our beef, we will be needlessly sacrificing our share of the gains from trade. If we increase restrictions on their cars, we will be the main losers; car buyers in Australia will pay more, and the additional cost of transport equipment will be built into our cost structure. This assertion is not new-frangled economic rationalism. On this matter, Adam Smith (whom C.D. Kemp quotes, approvingly but selectively in the December issue) said, 'when there is no probability that such a repeal can be procured, it seems a bad method of compensating the injury done to certain classes of our people to do another injury ourselves'. In the realm of flat earth economics, our tariffs impose costs *on the foreigner,* and we benefit. In the real world, and in Adam Smith's world, both parties lose. This is especially costly for small countries which have little bargaining power, and which do not have sufficiently large markets to achieve low-cost self-sufficiency.

If Japan (or the EC) wants to damage itself by restricting our beef in order to placate its farmers, then it is the Japanese and EC customers and taxpayers who pay a large cost, as we keep pointing out to them. We are also damaged, but for us to impose, in reprisal, a similar cost on our own consumers and/or taxpayers, would be a triumph of flat earth economics.

Readers of the *Quadrant* debate may be under the misapprehension that the free traders have held sway unchallenged ever since Adam Smith. In fact they have survived many largely fruitless challenges, as recounted by Douglas Irwin ('Challenges to Free Trade', *Journal of Economic Perspectives,* Spring 1991, American Economics Association). For example, he quotes John Stuart Mill's initial support of protection (1848) for 'infant industries', and his subsequent retreat. In fact, infant industries rarely grow up. Irwin's review covers older debates somewhat related to the current focus on 'strategic industries and reciprocity', and concludes that '... a free trade policy is difficult to improve upon. Identification of possible exceptions to free trade by economic theorists mean neither that such circumstances can be isolated and identified in practice, nor that such exceptions would constitute sound economic policy'.

What the great majority of Australian economists have been advocating for decades is that our governments cease favouring the Ugly Sisters—the inefficient—over the Cinderallas—the efficient. A few years ago, some journalist must have twisted this into an inexact analogy about 'level playing fields'. This has been widely adopted, despite the fact that a bumpy football ground or cricket pitch favours the lucky (those who get the favourable bounce), rather than the efficient. The metaphor has been extended to the world economy, though initially it was a plea to the Australian Government by economists for equal treatment *in our domestic economy,* which is something within our capacity to achieve. Tariff reformers were then subjected to the absurd criticism that they had not noticed that the world market has been 'corrupted by protection', so that their 'perfect competition prescription cannot apply'. However, the economists' prescription holds quite regardless of the degree of fair competition in world markets; that is, Australian governments should foster 'fair competition' domestically, by avoiding *discriminatory* industry assistance, whether to export or import competing products.

World prices *are* in many cases distorted. But if we subsidise our dairy exports so that we consistently sell at below production cost, simply because other exporters do so, we are retaining resources in dairying when they would earn more in, say, beef, and they would move to beef etc under a non-discriminatory price policy. The fact that world dairy product prices are normally low and 'unfair' because of dumping, and have been so for decades, is irrelevant—they are the actual prices we receive. Similarly, subsidies in the form of tariffs retain resources in protected import-competing activities so that they earn less than their opportunity cost, that is, their earnings in alternative uses.

Unfair competition from cheap foreign labour

Early this century, concern to protect the wage levels set by arbitration was the prime motivation for tariffs, and several *Quadrant* contributors have advanced this justification (see W.C. Wentworth, April issue, p. 62; Kemp, May issue, p. 28). From a flat earth perspective it seems plausible that all cheap-labour countries would have a permanent trade surplus, and all dear-labour countries a deficit. However, to that proposition a *reductio ad absurdum* can be applied, by asking 'How do the latter pay for their imports?' In any case, we notice that in the real world, low-wage countries frequently have large trade deficits. Second, we must ask the question 'What about the *productivity* of labour, as distinct from its price?' Protectionists often want it both ways—protection against cheap but unproductive labour (the Philippines), or dear but productive labour (Japan). In fact, low labour productivity is the main reason for labour being cheap in developing countries. It is unproductive because each worker is backed by relatively little capital (especially 'hi-tech' capital) and land—a *different pattern of resource endowment* from Australia's.

Another question suggest itself. *'All* activities in the traded goods sector must cope with our high wage levels, *so why do only some 'need' high protection?'* Does the argument apply only to our labour-intensive activities? If so, this is equivalent to saying: 'Protection is 'needed' for activities unsuited to our relative factor endowments', which is different from the statement about 'unfairness'.

If the relative abundance and therefore the cheapness of the labour of our Asian competitors is unfair, isn't it equally true that from the viewpoint of EC farmers, our abundant and therefore cheap land provides grossly unfair competition, especially when associated with mild winters, which remove the large expense of housing animals? But aren't differing resource endowments a major *reason* for trade? Thus we are driven to another *reductio ad absurdum:* 'If trade is to provide benefits it must be 'unfair' and should not be allowed to happen'.

It must be remembered that the exchange rate determines the landed cost of imports, as well as labour costs. Exchange rates adjust so that 'exports equals imports' in the long run, *after* allowance for dear or cheap labour, high or low labour productivity, dear or cheap land, and a host of other factors which affect the competitive position of Australian industry as against overseas industry.

Some people feel that there is a compelling, ethical objection to our saying to low-wage countries: 'We cannot give you free access to our markets, facilitating development and alleviating your poverty, because your wages are too low, that is *you are too poor'*. A common plea from developing countries is 'Trade, No Aid'—surely not an extravagant request.

Note 1: The effective rate of protection measures the benefit conferred on producers as a percentage of the value added in the process (eg steel-making). For example, if half of the cost of a steel end-product is in the raw materials (principally coal and iron), and that steel product has a nominal tariff of 10%, then the ERP for that steel processing is 20%. The tariff has increased the value added (product value less raw material costs) by 20% compared with free trade.

Source: *Quadrant,* December 1991, pp. 50–4.